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The issuance of this publication approved in accordance with NAVEXOS P-35.

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CONTENTS

Credits: All pictures are Official U.S. Navy Photographs unless otherwise indicated.

March 3, 1972 marks the 101st Birthday of the Navy Medical Corps. An historic photo graces the front cover — five Surgeons General of the Navy Medical Corps gathered to cut the cake at the 100th Birthday Ball in Washington, D.C. VADM George M. Davis, MC, USN (right), present Surgeon General, was joined by four Surgeons General emeritus, standing from left to right: RADM Clifford A. Swanson (1946-1951), RADM Lamont Pugh (1951-1955), VADM Robert B. Brown (1965-1969), and RADM Bartholomew W. Hogan (1955-1961). A better view of RADM Pugh, MC, USN (Ret.) appears on page 44 where he is shown greeting VADM Davis and the first lady of the Navy Medical Department.

Page 4 photo reveals VADM G.M. Davis, MC, USN, Surgeon General, cutting the 99th Birthday Cake on 3 Mar 1970. That occasion marked the first official celebration of the formal founding of the Medical Corps on 3 Mar 1871.

Pages 32 and 33 were artistically executed by HM3 Michael A. Willhoite, USN, our creative artist. The delightful sonnet was composed by LCDR W.F. Wieting, MC, USNR. The accomplished poet received a standing ovation after reciting his poem at the 100th Anniversary Medical Corps Ball in Portsmouth, N.H. He was released to inactive duty in July 1971. We are grateful to CAPT R.A. Fisichella, MC, USN, Commanding Officer, Nav Hosp Portsmouth, N.H., for bringing the sonnet to our attention.

The continued support of Mrs. S.B. Hannan, BUMED Code 4542, and the Illustration and Exhibits and Photography Divisions of the Medical Graphic Arts Dept., Naval Medical School, NNMC, Bethesda, Md., is gratefully acknowledged.

THE SECRETARY OF THE NAVY

WASHINGTON

TO THE OFFICERS OF THE MEDICAL CORPS

The history of the Navy Medical Corps is resplendent with individual acts of heroism and countless examples of devotion to duty.

The strength of the modern Navy is still her people and your selfless service to our sailors and marines and their families has done much to add to our reputation for taking care of our own. We shall continue to rely on your skill, your compassion, and your dedication in this era of ever increasing responsibilities and opportunities. I am fully confident in your ability to meet this challenge.

It is a pleasure to extend my very best wishes to each of you on the occasion of your 101st anniversary.

John H. Chafee

JOHN H. CHAFEE

CHIEF OF NAVAL OPERATIONS

TO THE OFFICERS OF THE MEDICAL CORPS

Since the earliest days in our nation's history medical officers have served the fleet with skill and distinction; and their selfless service to the men of the Navy and Marine Corps and their families helped to establish the well deserved reputation for devotion to duty that the Medical Corps enjoys today.

Each of you have helped to add luster to this tradition and your contributions to the better health of all mankind have spanned every field and specialty of medical practice. Your performance has upheld the highest standards of your profession and I look forward to your continued support of our efforts to provide even greater service to our people.

On the occasion of the 101st anniversary of the founding of your Corps I am delighted to extend to each of you my personal thanks for your exemplary performance and my very best wishes for a most Happy Birthday.

E. R. ZUMWALT, JR.
Admiral, U.S. Navy

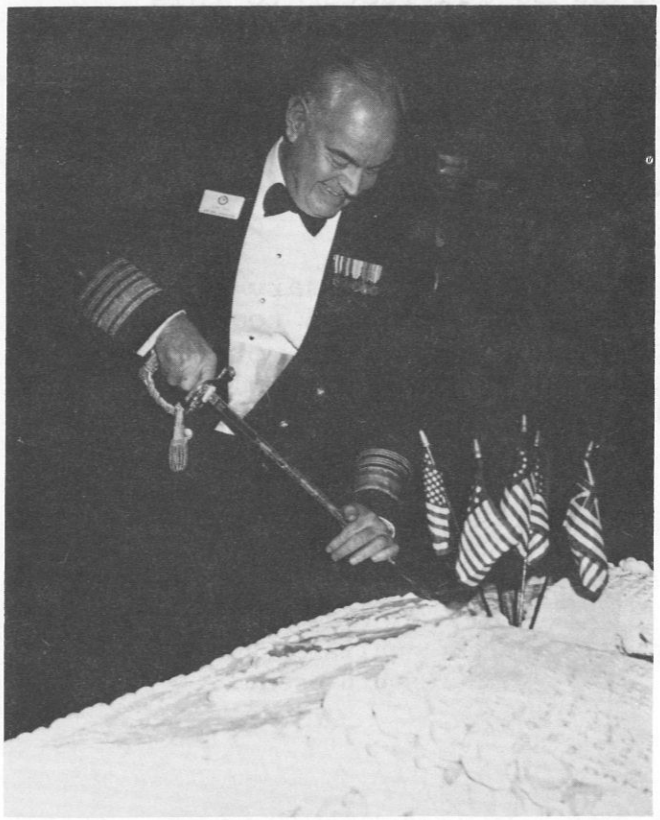
TO THE OFFICERS OF THE MEDICAL CORPS

The history of the Navy Medical Corps is filled with countless examples of heroic performance by those medical officers who have served, and are serving, with the Marine Corps.

That we have always been able to meet our worldwide commitments is due in no small measure to their skills, their compassion, and their exemplary devotion to duty. On the occasion of the 101st Anniversary of the formal founding of your Corps, it gives me a great deal of pleasure, on behalf of every Marine, to extend my greetings and best wishes to each of you.

All Marines wish you a happy birthday and we look forward to your continued support.

R. E. CUSHMAN, JR.
General, U. S. Marine Corps
Commandant of the Marine Corps



from the Chief

On 3 March 1972, one hundred and one years after the formal establishment of the Medical Corps, the primary duty of every naval physician remains the same — to provide the best possible health care to active duty and retired Navy and Marine Corps personnel and their families.

Our system for providing this care is one of the most comprehensive, responsive, and economical systems available to any large group of people in the nation today. But it can and must be improved to make it more responsive to our patients and more professionally satisfying to our health care personnel. Our actions to improve our system must be such that they reaffirm to all the fact that we care about, as well as care for, our patients.

As we enter the second year of our second century I shall continue to rely on your skill, your knowledge, and your empathetic understanding. The challenge is great, and we must meet it with the same devotion to duty and dedicated professionalism that has always been the hallmark of our Corps.

Thank you for your outstanding performance and please accept my very best wishes for a most Happy 101st Birthday.

DEPARTMENT OF THE NAVY
ASSISTANT CHIEF OF THE BUREAU OF MEDICINE AND SURGERY (DENTISTRY)
AND
CHIEF OF THE DENTAL DIVISION
WASHINGTON, D. C. 20390

TO THE OFFICERS OF THE MEDICAL CORPS

On this, the 101st Anniversary of the Medical Corps, it is a distinct pleasure to extend to each of you heartiest congratulations and best wishes from the members of the Naval Dental Corps.

The Medical Corps of the Navy is charged with the responsibility for the health and well-being of the men and women who serve on the first line of defense of our Nation. You keep our most important resource fit at their stations on land, sea, or air (mens sana in corpore sano). Equally important is the health care you provide their families and loved ones. Responsibility, Dedication and Patriotism are inherent qualities you possess as demonstrated by your performance, past and present.

As an integral part of the Medical Department, we in the Dental Corps salute you. We are proud to be associated with you in providing total health care.

Happy Birthday!

E. C. RAFFETTO
Rear Admiral, DC, USN

DEPARTMENT OF THE NAVY
CHIEF OF THE MEDICAL SERVICE CORPS
BUREAU OF MEDICINE AND SURGERY
WASHINGTON, D. C. 20390

TO THE OFFICERS OF THE MEDICAL CORPS

On the occasion of the 101st Anniversary of the establishment of the Navy Medical Corps, it is a pleasure to extend hearty and sincere congratulations from all officers of the Medical Service Corps.

The officers of your Corps have consistently distinguished themselves, both individually and collectively, and on both

local and national levels. You may take just pride in the contributions you have made to the health and welfare of military members and their families throughout the world.

I speak for all officers of our Corps in pledging to your Corps our continued support in the fulfillment of the mission of the Navy Medical Department and in extending best wishes for the future.

Happy Birthday!

E. L. VAN LANDINGHAM, JR.
Captain, MSC, USN

DEPARTMENT OF THE NAVY
BUREAU OF MEDICINE AND SURGERY
WASHINGTON, D.C. 20390

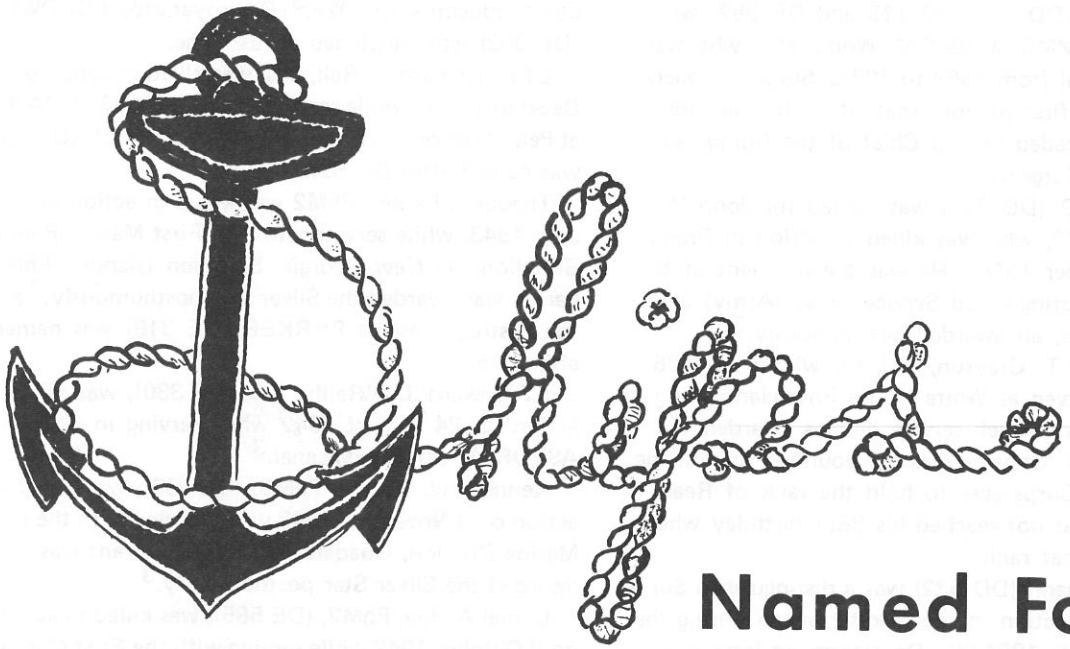
TO THE OFFICERS OF THE MEDICAL CORPS

Nurse Corps Officers are proud to extend a most respectful salute to members of the Navy Medical Corps on the occasion of your One Hundredth and First Anniversary.

Since the establishment of your Corps, each member has met the challenge of his mission in time of peace and war with fidelity and sincerity. Again, this past year another chapter of outstanding professional achievement and dedication has been added to the history of the Medical Department of the United States Navy.

Heartiest congratulations and best wishes for a rewarding and fruitful future.

ALENE B. DUERK
Captain, NC, USN
Director, Navy Nurse Corps



Named For Navy Medical Personnel

By W. Kenneth Patton, Medical Historian, Bureau of Medicine and Surgery, Washington, D.C.

More than 10,000 ships have been commissioned in the United States Navy.[1] Each has contributed to a proud heritage dedicated to man's unceasing hope for freedom from war. These vessels have been of many classes and types (now more than 200), ranging from tiny sailing vessels to the giant aircraft carriers of the modern fleet.

The Division of Naval History has collected data on every vessel known to have flown the United States flag. Five volumes of these ships' histories have been compiled and arranged alphabetically during the past 12 years, and publication of at least one more volume is pending.

Most ships have had names, although some have been known only by letter and number symbols. Ships have been named for states, cities, counties, rivers, mountains, stars, fish, notable battles and landmarks, and other entities. By far the largest number of ships have been named for distinguished Navy personnel or other individuals who have been closely associated with the Navy. Most of the ships named for people have been destroyers and destroyer escorts.

There have been many ships — in successive generations — that have borne the same name. No two ships bear the same name at the same time. The names of many of the sailing vessels commissioned prior to the Civil War have been reused for later commissioned ships to perpetuate the memory of those proud names.

The first ship honoring a member of the U.S. Navy Medical Department was KANE (DD 235). This destroyer, named for Assistant Surgeon Elisha Kent Kane, was commissioned 11 June 1920 and saw extensive service throughout World War II. Dr. Kane was internationally respected in the 1850's for participation in two Arctic Expeditions in search of Sir John Franklin. Another ship (AGS 25, later redesignated APD 18) was also named for Dr. Kane.[1]

Biographic material and photographs of all of the ships and Medical Department personnel are not readily accessible. The names of five of this distinguished group have been selected for particular mention; in no way are the others any less distinguished.

Three ships (DD 317, DD 715 and DE 287) were named for COMMO William M. Wood, MC, who was Surgeon General from 1869 to 1871. Surgeon General Wood was the first to hold that title, although four other men preceded him as Chief of the Bureau of Medicine and Surgery.

LITCHFIELD (DD 336) was named for John R. Litchfield, PhM3, who was killed in action in France on 15 September 1918. He was the recipient of the Navy Cross, Distinguished Service Cross (Army) and two Silver Stars, all awarded posthumously.[2]

RADM Cary T. Grayson, MC, for whom DD 435 was named, served as White House Physician during World War I, for which service he was awarded the Navy Cross. Dr. Grayson was the youngest man in the Navy Medical Corps ever to hold the rank of Rear Admiral; he had not reached his 38th birthday when promoted to that rank.[4]

Lewis Heermann (DD 532) was a distinguished Surgeon who saw action in the Mediterranean during the War with Tripoli, 1804-06. Dr. Heermann later established and maintained a naval hospital in New Orleans from about 1814 to 1830.

The destroyer LONGSHAW (DD 559) was named after William Longshaw, Jr., a young (25-year-old) Assistant Surgeon, who was killed in action during the Civil War while ministering to the wounded in an attack on Fort Fisher, N.C., on 15 January 1865.[4]

Destroyer escort MILES (DE 183) was named after LTJG Samuel S. Miles, MC, Surgeon of the First Marine Raider Battalion. Dr. Miles was killed in action when that unit launched an attack on Tulagi, Solomon Islands on 7 August 1942. The physician was awarded the Silver Star posthumously.[3]

LTJG Ben R. Bronstein, MC, after whom the BRONSTEIN (DE 189) was named, was serving in USS JACOB JONES on 28 February 1942 when that ship was sunk by a German submarine, U-578, off the New Jersey coast. There were less than 30 survivors.[3]

William P. Liddle, Jr., HA1, was killed in action on 19 August 1942, while serving with the First Marine Division on Guadalcanal. HA1 Liddle was awarded the Silver Star posthumously, and the destroyer escort LIDDLE (DE 206) was named in his memory. DE 76 had previously been designated as LIDDLE, but before commissioning she was transferred to the United Kingdom under the provisions of the Lend-Lease Act.[3] The ship was then designated HMS BLIGH (K 467).

LCDR Thomas E. Crowley, DC, was killed in action on 7 December 1941, while serving in USS ARIZONA, at Pearl Harbor. Dr. Crowley had served as an enlisted man in the Navy from 1919 to 1923. He later accepted a commission in the Dental Corps after completing his dental education in 1929.[3] Destroyer escort CROWLEY (DE 303) was christened in his name.

LTJG Richard R. Rall, MC, was killed in action on 7 December 1941 while serving in USS PENNSYLVANIA, at Pearl Harbor.[3] The destroyer escort RALL (DE 304) was named after Dr. Rall.

Thaddeus Parker, PhM2 was killed in action on 20 July 1943, while serving with the First Marine Raider Battalion, on New Georgia, Solomon Islands. PhM2 Parker was awarded the Silver Star posthumously,[3] and the destroyer escort PARKER (DE 319) was named after him.

LT Edward J. O'Reilly, DC, (DE 330), was killed in action on 24 August 1942 while serving in USS ASTORIA, off Guadalcanal.[3]

Kenneth W. Durant, PhM3, (DE 389), was killed in action on 3 November 1942 while serving with the First Marine Division, Guadalcanal. PhM3 Durant was awarded the Silver Star posthumously.[3]

Daniel A. Joy, PhM2, (DE 585), was killed in action on 8 October 1942 while serving with the First Marine Division, Guadalcanal. PhM2 Joy was awarded the Navy Cross posthumously.[3]

LT Henry R. Ringness, MC, (DE 590), died of wounds received in action on 17 October 1942, while serving with the First Marine Division, Guadalcanal. Dr. Ringness was awarded the Navy Cross posthumously.

CAPT Elphege A.M. Gendreau, MC, (DE 639), was killed in action on 21 July 1943 while conducting an inspection trip as Fleet Surgeon, Pacific Fleet. Captain Gendreau was assisting in the care and evacuation of wounded when a Japanese dive bomber struck the LST-343 in which he was embarked. Captain Gendreau was awarded the Legion of Merit posthumously.[3]

Paul S. Frament, PhM3, (DE 677), died of wounds received in action on 19 November 1942, while serving with the Second Marine Division on Guadalcanal. PhM3 Frament was awarded the Silver Star posthumously.[3]

Richard P. Jobb, PhM3, (DE 707), was killed in action on 26 January 1943 while serving with the Second Marine Division, on Guadalcanal. PhM3 Jobb was awarded the Silver Star posthumously.[3]

Fred F. Lester, HA1, (DE 1022), was killed in action on 8 June 1945 while serving with the Sixth Marine Division, on Okinawa. HA1 Lester was awarded the Medal of Honor posthumously.[3]

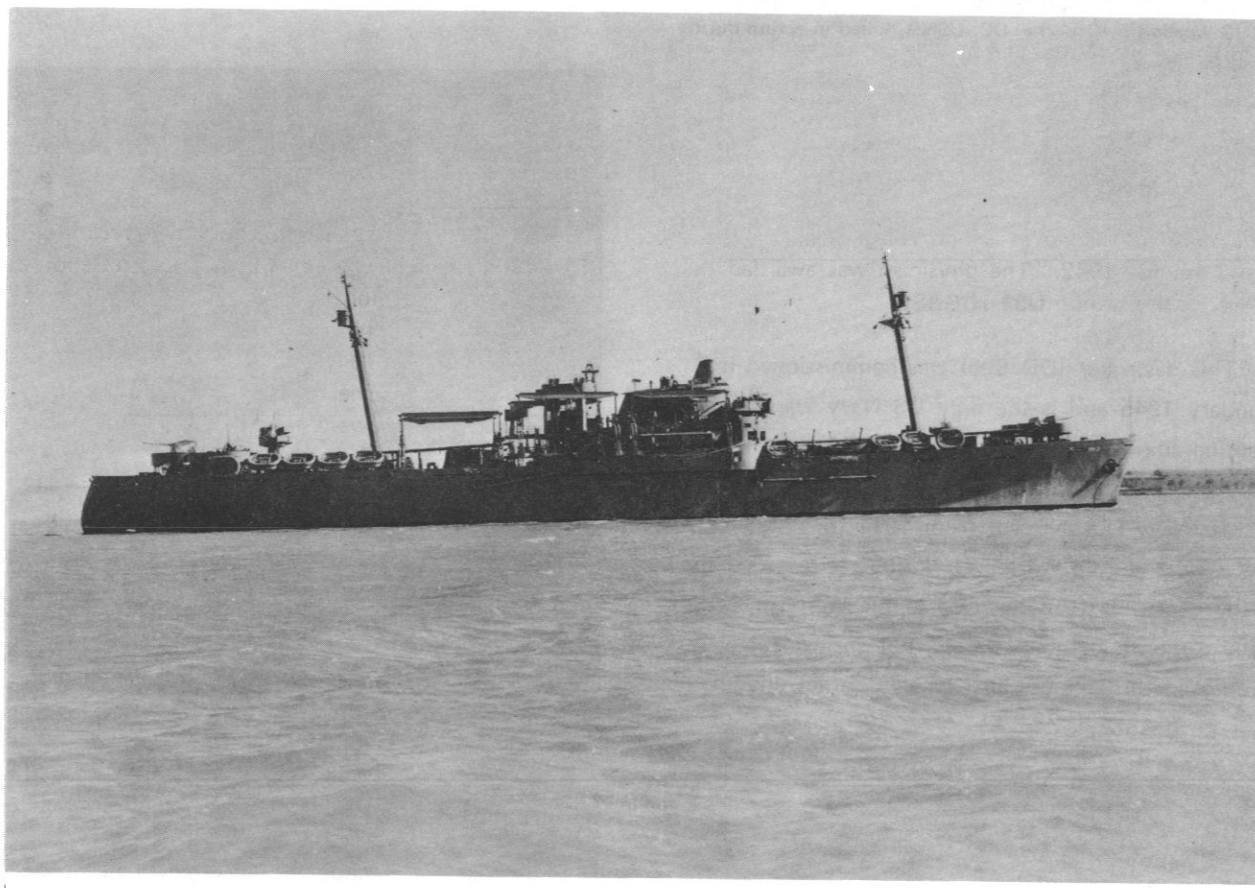
Francis C. Hammond, HN, (DE 1067), was killed in action on 27 March 1953 while serving with the First Marine Division, in Korea. HN Hammond was awarded the Medal of Honor posthumously.[1,3] (The Francis C. Hammond High School in Alexandria, Va., also was named in honor of his memory.)

Three vessels, TRYON, PINKNEY and RIXEY, APH1, APH2 and APH3 respectively, served the Fleet during World War II as ambulance ships. TRYON was named for COMMO James R. Tryon, MC, who served as Surgeon General from 1893 to 1897. PINKNEY was named for Medical Director Ninian Pinkney, who is best known for his contribution during the Civil War as Fleet Surgeon, Mississippi River Squadron. RIXEY was named for RADM Presley M. Rixey, MC, who was Surgeon General from 1902 to 1910.

USS RIXEY

Originally built for the Maritime Commission, this ship was refitted and named RIXEY (APH 3) in February 1943. She served as an ambulance ship with spaces for more than 1,200 patients and participated in four landing operations. In March 1946, she was renamed PRIVATE WILLIAM H. THOMAS (AP 185) and was used as a troop transport until 1957 when she was stricken from the Navy Register. RIXEY honored the memory of RADM P.M. Rixey, MC, Surgeon General from 1902 to 1910. Dr. Rixey was White House Physician to Presidents McKinley and Theodore Roosevelt. He was with President McKinley when that President was assassinated at Buffalo, N.Y.* Among the more notable accomplishments of Admiral Rixey were: 1) establishment of the first Hospital Corps School, 2) creation of the Nurse Corps, 3) establishment of the Navy Medical School, 4) establishment of a sanitarium for the treatment of tuberculosis, and 5) remodeling and construction of new naval hospitals.[5] There were three ships of this class used during WW II. They were distinguished from hospital ships in that they were not painted white, and they actively participated in landing operations.

*See feature article on page 45.



USS RIXEY (APH 3)

LTJG Weedon E. Osborne, DC, USNR, killed in action during WWI in France.

USS OSBORNE

This destroyer (DD 295) was commissioned in May 1920. She was named for LTJG Weedon E. Osborne, DC, who was killed in action on 8 May 1917 in the Chateau Thierry area, France, while ministering to the wounded. Dr. Osborne was awarded the Medal of Honor and Distinguished Service Cross posthumously. OSBORNE had a service life of only about ten years; she was decommissioned and scrapped in May 1930 as a result of the Naval Disarmament Conference. During her service she operated only in the Atlantic and the Mediterranean.[1]

USS HIGBEE

This destroyer (DD 806) was commissioned in January 1945 and is the only US Navy warship (excepting auxilliaries) ever to be named in honor of a woman. Mrs. Lenah S. Higbee was Superintendent of the Navy Nurse Corps from 1911 to 1922; for her service during World War I she was awarded the Navy Cross. HIGBEE arrived in the Western Pacific only a month before V-J Day, but she was actively employed throughout the Korean Conflict and the war in SEASIA.[4]

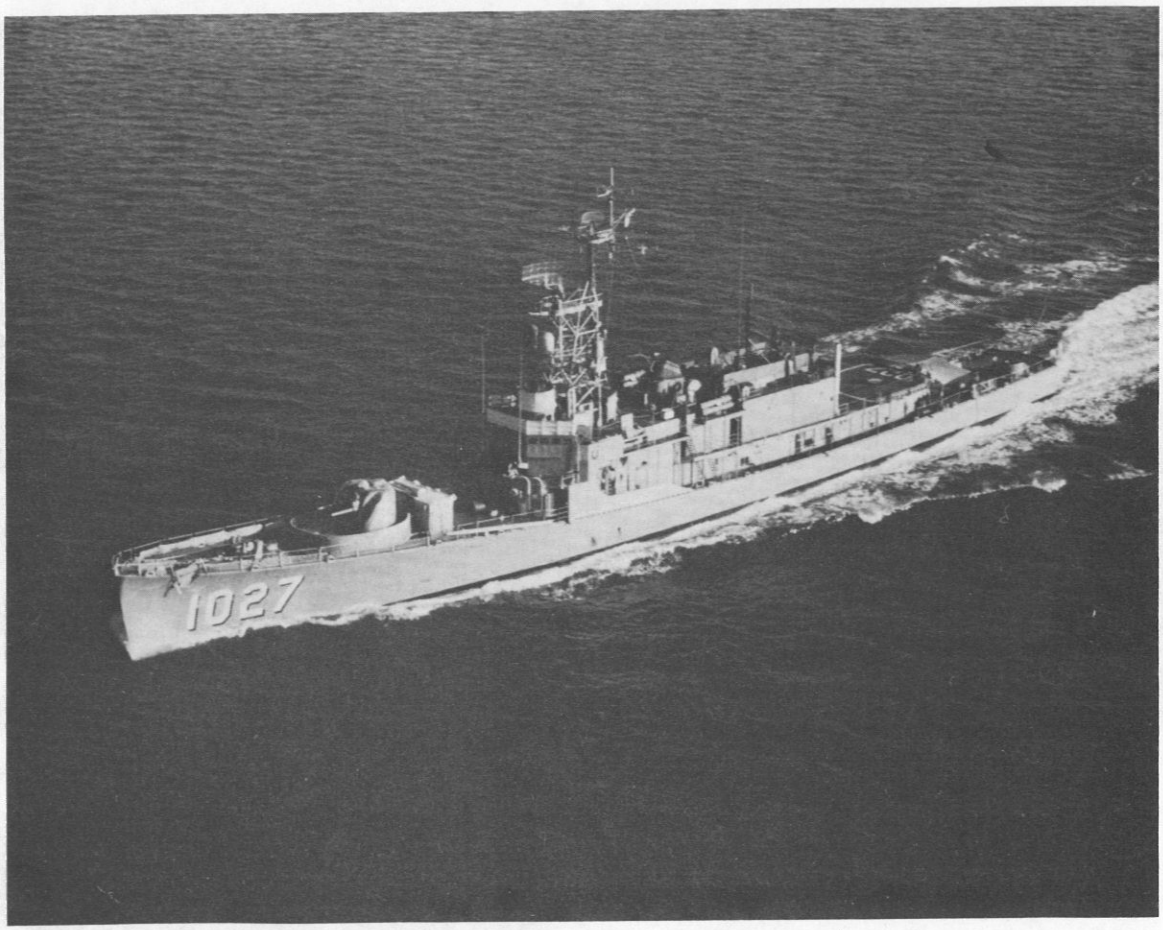
Mrs. Lenah Higbee, Superintendent, Nurse Corps, 1911-22.

The radar picket destroyer USS HIGBEE (DD 806) is pictured underway off the coast of San Diego, Calif., on 25 Aug 1967.

USS BLACKWOOD

This destroyer escort (DE 219) was commissioned in December 1943, named after CDR James D. Blackwood, MC. BLACKWOOD was decommissioned in 1958. Three years later she was recommissioned for another year, following which she was placed in reserve at Philadelphia. Dr. Blackwood was killed in action while serving in USS VINCENNES during the battle of Savo Island on 9 August 1942. Dr. Blackwood had been awarded the Navy Cross for service in USS PRESIDENT LINCOLN on 31 May 1918.[1]

CDR James Douglas Blackwood, MC, USN (dec.). (Courtesy of CDR Blackwood's daughter, Mrs. S.B. Hannan, who adds artful touches to our publication via the Graphics section of Printing Branch, BUMED.)



The escort ship USS JOHN HARLAN WILLIS (DE 1027) is pictured underway in Rhode Island Sound, 3 Feb 1971.

John H. Willis, PhM1, USN

USS WILLIS

This destroyer escort (DE 1027) was named in honor of John Harlan Willis, PhM1, who was killed in action on 28 February 1945. Awarded the Medal of Honor posthumously, PhM1 Willis had ministered to wounded Marines on Iwo Jima despite his own injuries, and paid the supreme sacrifice "completely unmindful of his own danger." The WILLIS was commissioned in February 1957. She had been specially equipped for anti-submarine warfare and has operated principally in the Atlantic and the Mediterranean.[1]

SHIPS NAMED FOR NAVY MEDICAL DEPARTMENT PERSONNEL

Hull No.	*Ship*	*Named for:*	*Notable Service*
DD 235	KANE	E.K. Kane, Asst. Surg.	Grinnell Expedition
DD 295	OSBORNE	W.C. Osborne, LTJG, DC	WW I (KIA)
DD 317	WOOD	W.M. Wood, Commo, MC	S.G., 1869-71
DD 336	LITCHFIELD	J.R. Litchfield, PhM3	WW I (KIA)
DD 435	GRAYSON	C.T. Grayson, RADM, MC	White House Physician
DD 532	HEERMANN	L. Heermann, Surg.	War with Tripoli
DD 559	LONGSHAW	W. Longshaw, Jr., Asst. Surg.	Civil War (KIA)
DD 715	WOOD	W.M. Wood, Commo, MC	S.G., 1869-71
DD 806	HIGBEE	L.S. Higbee, Ch. Nurse	WW I, Supt. Nurses
DE 183	MILES	S.S. Miles, LTJG, MC	WW II, (KIA)
DE 189	BRONSTEIN	B.R. Bronstein, LTJG, MC	WW II, (KIA)
DE 206	*LIDDLE	W.P. Liddle, Jr., HA1	WW II, (KIA)
DE 219	BLACKWOOD	J.D. Blackwood, CDR, MC	WW II, (KIA)
DE 287	**WOOD	W.M. Wood, Commo, MC	S.G., 1869-71
DE 303	CROWLEY	T.E. Crowley, LCDR, DC	WW II, (KIA)
DE 304	RALL	R.R. Rall, LTJG, MC	WW II, (KIA)
DE 319	PARKER	T. Parker, PhM2	WW II, (KIA)
DE 330	O'REILLY	E.J. O'Reilly, LT, DC	WW II, (KIA)
DE 389	DURANT	K.W. Durant, PhM3	WW II, (KIA)
DE 585	JOY	D.A. Joy, PhM2	WW II, (KIA)
DE 590	RINGNESS	H.R. Ringness, LT, MC	WW II, (KIA)
DE 639	GENDREAU	E.A.M. Gendreau, CAPT, MC	WW II, (KIA)
DE 677	FRAMENT	P.S. Frament, PhM3	WW II, (KIA)
DE 707	JOBB	R.P. Jobb, PhM3	WW II, (KIA)
DE 721	WOODS	D.O. Woods, HA1	WW II, (KIA)
DE 1022	LESTER	F.F. Lester, HA1	WW II, (KIA)
DE 1027	WILLIS	J. Willis, PhM1	WW II, (KIA)
DE 1067	HAMMOND	F.C. Hammond, HN	Korea (KIA)
AGS 27	+KANE	E.K. Kane, Asst. Surg.	Grinnell Expedition
APH 1	TRYON	J.R. Tryon, Commo, MC	S.G., 1893-97
APH 2	PINKNEY	N. Pinkney, Med. Dir.	Fleet Surg., Civil War
APH 3	RIXEY	P.M. Rixey, RADM, MC	S.G., 1902-10

*DE 76 was laid down and named LIDDLE, but never commissioned in U.S. Navy; she was launched 31 May 1943 and transferred to United Kingdom as HMS BLIGH (K 467).

**Construction was canceled before completion.

+Redesignated APD 18.

S.G. = Surgeon General, U.S. Navy.

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CORONARY ARTERIOGRAPHY

A Review of Clinical Applications, Including Consideration of the Problem of Selecting Patients for Myocardial Revascularization Operation

By CAPT Dixon A. Lee, MC, USN,
Cardiology Branch, Medicine Service, Naval Hospital,
National Naval Medical Center, Bethesda, Md.

Selective coronary arteriography has become widely available recently and is now considered an essential technique in the sophisticated cardiac catheterization laboratory.[1] Aside from its importance as a major impetus to the development of surgical myocardial revascularization techniques, and its use in selecting patients for this form of therapy, selective coronary arteriography has other important clinical applications. As is true of any clinical procedure, it is important to clearly define the technique in terms of its dangers and its limitations and also of its usefulness. These are the purposes of this communication.

Angiographic Techniques and Complications

Techniques. Retrograde catheterization of the left ventricle and left ventriculography are integral parts of the complete angiographic study of the coronary circulation. Right heart catheterization, routine hemodynamic measurements, and special metabolic studies are also accomplished frequently, but vary with the individual patient and the laboratory's orientation. The most widely used X-ray systems for coronary arteriography involve the use of high intensity pulsed X-ray, image intensification fluoroscopy and 35 mm cine film recording. Properly functioning equipment of this type affords excellent resolution of small vessels, visualization of vessels in motion, and a basis for an estimate of dynamic coronary flow.

Complications. Despite the clinical usefulness of this technique there are disadvantages: the expense of the equipment, significant X-ray exposure to the patient and to laboratory personnel, and limitations in projecting 35 mm film. The iodinated contrast materials which must be injected selectively and repeatedly into each coronary artery during angiographic study have adverse cardiovascular effects, including transient production of bradycardia, hypotension, conduction abnormalities, and occasionally ventricular fibrillation.[2] The first three of these effects are usually self-limited but often they require prompt treatment with atropine, isoproterenol or vasopressors. Ventricular fibrillation occurs during coronary arteriography in normal persons as well as in those who have cardiac disease.

The opinions and assertions contained herein are the private ones of the author and are not to be construed as official or as reflecting the views of the Navy Department or of the naval service at large.

However, the incidence of ventricular fibrillation is below 1% when the newer low-sodium contrast media are used. Nearly all patients who suffer this complication are resuscitable by a well-disciplined catheterization laboratory team prepared to apply countershock within seconds after the onset of this arrhythmia. However, complications lead to death in approximately 0.1% of patients undergoing study. Myocardial infarction precipitated during coronary angiography occurs at a rate estimated to be less than 0.5% and usually appears in patients with advanced coronary disease, although catheter-induced trauma to the coronary ostia may occasionally occur in the absence of severe coronary obstruction.[3]

Other complications which attend retrograde catheterization of the left ventricle also can be expected. Since brachial arteriotomy leads to fewer serious complications than percutaneous catheterization of the femoral artery, many cardiologists favor the former approach, using the special flexible tipped catheter designed by Dr. F. Mason Sones, Jr.[4] The Seldinger technique for coronary arteriography, popularized by Dr. M.P. Judkins,[5] involves use of stiffer preformed catheters inserted via the femoral artery and this method is complicated by occasional loss of femoral pulse.[6] There is also a higher incidence of catheter injury of the coronary arteries when the Judkins technique is utilized.[7] Although the latter method can be mastered with greater ease by catheterization laboratory physicians, many laboratories no longer apply it routinely but favor the more difficult, safer, Sones approach.

Indications for Coronary Arteriography

As with any clinical laboratory procedure which is expensive, which causes patient discomfort, and which carries a significant although small risk, the decision to select a patient for coronary arteriography should be based upon considerations of the risks to, and of the benefits for the individual patient. Angiographic study of the coronary arteries is most frequently indicated to assist in the management of patients in four clinical situations:

(1) *To prove or to exclude the presence of significant coronary arterial obstruction when standard diagnostic methods are inconclusive and when more precise diagnostic information will assist in the care of the patient.*

The medical history in the case of classical angina pectoris, and the 12-lead electrocardiogram in the case of recent transmural myocardial infarction, are reliable indicators of coronary artery disease in the absence of left ventricular outflow obstruction, other serious valvular disease, or primary myocardial disease.[8] However, as many as 40% of patients with "atypical angina" do not have significant coronary artery disease.[9,10] Unfortunately, clinical studies including submaximal stress testing frequently fail to identify the patient whose atypical symptomatology is secondary to significant coronary luminal narrowing.[11] Even the presence of nonspecific T-wave abnormalities on the resting electrocardiogram is not helpful because 25% of such patients have normal coronary arteriograms. Nonspecific T-wave abnormalities and intraventricular conduction defects (e.g. left bundle branch block) discovered on routine electrocardiograms in asymptomatic persons often suggest the possibility of ischemic heart disease. Although clinical evaluation often will provide other evidence of coronary disease,[12] if the latter is the cause of electrocardiographic abnormalities, additional evidence provided by selective coronary arteriography may be required in select cases in order to allow a confident diagnosis upon which to base sound occupational advice and accurate medical therapy.

At present it does not appear justified to study patients with clinically proved coronary artery disease in order to obtain individual prognostic information. There are few studies which allow the rendering of a prognosis on the basis of the extent of the disease as depicted angiographically.[13] This type of correlation is sorely required to improve future patient selection for coronary artery operation. When such natural history data become available, more liberal application of coronary arteriography may be indicated in patients with known coronary artery disease.

(2) *To aid in the surgical management of patients with valvular disease.*

While electrocardiography and history are the two most reliable clinical tools used to support a diagnosis of coronary artery disease, both are frequently of limited value in this regard in patients with severe aortic stenosis. Either coronary artery disease or aortic stenosis may be responsible for angina and either one may produce electrocardiographic abnormalities of anterior myocardial infarction. The clinician is handicapped further, in that over 17% of adults with severe aortic stenosis have significant concomitant coronary atherosclerosis.[14] In the past, high operative mortality rates and inadequate hemodynamic responses to operation in aortic stenosis have been attributed to unrecognized and untreated coronary disease.[15] There is also a high incidence of unrecognized coronary disease associated with other valvular lesions.[14,16] Hence, it is probably wise to accomplish selective coronary arteriography in conjunction with cardiac catheterization study, in all patients over 40 years of age who require valvular heart surgery.

Accidental transection of a major coronary artery may seriously compromise the results of operation for congenital heart disease. Since there is a significant incidence of aberrant coronary artery distribution in tetralogy of Fallot and in transposition of the great vessels,[17,18] documentation of the coronary anatomy prior to operative correction of these lesions has been recommended.

(3) *To aid in differentiating constrictive pericarditis from restrictive myocardial disease.*

This is a somewhat novel use of coronary arteriography. Frequently in the past, clinical evaluation, roentgenography, cardiac catheterization, and complicated analysis of cardiac wave forms have failed to reliably differentiate constrictive pericarditis from restrictive cardiomyopathy. Often it has been necessary to subject patients to thoracotomy in order to make this differentiation. By demonstrating the position of the vessels on the surface of the cardiac silhouette in restrictive disease, and beneath the surface of the heart shadow in constrictive pericarditis, coronary arteriography now affords a less noxious and highly reliable solution to this occasional perplexing clinical problem.[19]

(4) *To select patients with coronary artery disease for surgical myocardial revascularization.*

The experience with saphenous vein bypass graft operation in femoropopliteal atherosclerosis[20] and the identification of coronary atherosclerosis as a predominantly proximal segmental obstructive process[21,22] provided a basis for trial of bypass operation in coronary atherosclerosis. The logic of bypass operation coupled with the inadequacy of medical treatment has precipitated widespread clinical application of this operative approach before sound proof of its efficacy has been demonstrated. Rather extensive experience has demonstrated that the technique can be accomplished with an operative mortality rate of less than 5%.[23] This form of treatment appears to alleviate angina and has been shown to be capable of reversing the metabolic abnormalities of myocardial ischemia.[24] Yet, these arguments in favor of direct myocardial revascularization must be weighed against several other facts: (a) there is no proof that the natural history of coronary artery disease is favorably affected, (b) the symptoms of many patients with angina spontaneously improve and they may live for many years, (c) disturbing reports have recently appeared describing intimal degenerative changes leading to early obstruction of saphenous aorto-coronary grafts.[25] Hence, some physicians still consider this form of treatment of coronary artery disease to be experimental and to be contraindicated except in the setting of a controlled investigative study.[26] Others advise it in nearly all symptomatic patients whose lesions are favorable for bypassing and whose left ventricular function is reasonably preserved.[27] This prominent polarization of opinions among leaders in the cardiology field further compounds the confusion engendered by lack of adequate scientific data, by the magnitude of the coronary disease problem, and by the inadequacies of medical therapy. Yet, relatively widespread acceptance of operative treatment of ischemic heart disease is an established fact. Because of this, the clinician should have some reasonable guidelines for selecting a patient for this form of treatment. Because any criteria which are proposed for patient selection at the present time have limited scientific bases, it is essential that the physician use these "criteria" only as guidelines. Thorough objective clinical evaluation of each patient is essential and must be supplemented by sound "clinical judgment." It has been proposed that patients in the following four categories be considered for coronary saphenous vein bypass operation: (a) Those having intractable angina pectoris; (b) Those with coronary artery disease who have symptoms suggesting an unusually high risk of death or myocardial infarction (preinfarction syndrome, Prinzmetal's angina, and those patients with markedly positive exercise electrocardiograms); (c) Those who require valvular heart surgery and who have significant coronary arterial obstructions, and; (d) Those with "critical lesions" as depicted by coronary arteriography.

Currently many cardiologists would agree that coronary artery bypass operation should be considered in patients with severe angina which precludes productivity and which does not respond to a trial of intensive medical therapy. However, the other three categories listed above require further comment.

Approximately one-third of patients surviving myocardial infarction will be dead in three to five years.[28,29] There are even more ominous clinical situations in which patients run a particularly high risk of sudden death or of myocardial infarction. Although it has been reported that preinfarction syndrome (crescendo angina, coronary intermediate syndrome) terminates in death or myocardial infarction within three months, these figures have recently been challenged[32] in from 23 to 93% of patients.[30,31] Prinzmetal's angina probably carries a poor prognosis with infarction and death appearing in less than one year in over half of this group of patients.[33] Evidence is at hand which indicates that patients with markedly positive exercise electrocardiograms frequently have severe obstruction of the left main coronary artery and are particularly susceptible to early catastrophic events.[34] Several medical centers are selecting patients in these "high risk" categories for operation; yet, the lack of data from

controlled studies and the lack of satisfactory proof of long-term efficacy of surgery in these clinical settings still necessitate caution in recommending routine operation at this date.

Patients who are subjected to open heart surgery for treatment of valvular heart disease or for ventricular aneurysm and who, by angiography, are proved preoperatively to have severe coronary artery lesions that can be bypassed, should probably have those lesions treated at the time of their open heart operation. The morbidity and mortality rates of valvular heart surgery appear to be reduced if significant coronary artery lesions are taken into account.

It has been suggested that patients with even mildly symptomatic coronary disease should have angiographic visualization of their coronary arteries, to be followed by myocardial revascularization surgery if significant obstructions are located at certain specified sites. Severe obstructive lesions in the left main coronary artery, or in the left anterior descending coronary proximal to the first septal perforator, have been thought to carry a poor prognosis. However, some evidence has been presented which tends to refute this contention. Because severe proximal left anterior descending or left main stem lesions probably provoke symptoms, as a rule, routine angiography in patients with mild stable symptoms or without symptomatology cannot be expected to yield significant numbers of patients with "critical" lesions. Hence, information of two types must become available before coronary artery operation can be considered in a patient without significant symptomatology, i.e.: (a) the long range results of surgery, and; (b) a correlation between natural history and the extent of coronary artery disease as depicted angiographically.

Summary

Selective coronary arteriography, a diagnostic technique, is useful in several clinical situations. Risk to the patient is small in angiographic laboratories possessing skilled personnel and proper equipment. Arteriographic study of the coronary circulation is appropriate in patients whose proper medical management requires precise anatomic coronary information. The technique is frequently useful in evaluating patients with suspected coronary artery disease when a diagnosis cannot be established by the more routine clinical methods, and it is a prerequisite for myocardial revascularization surgery. The latter procedure involves inserting a saphenous vein autograft between the ascending aorta and the coronary artery distal to its obstruction. Other forms of revascularization operation, including the Vineberg procedure, have little clinical application at present. Gas-endarterectomy and other direct revascularization techniques currently undergoing trial, in general, are not yet clinically applicable. Currently, the main use of saphenous vein bypass operation in coronary artery disease is for the palliation of intractable angina pectoris.

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According to a November 1 editorial, the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION will express measurements only in a "modified metric system," beginning in Jan 1973. The AMA took a stand favoring the use of the metric system in medicine nearly 100 years ago.

For 50 years, Navy Day was celebrated on 27 Oct. However, since 13 Oct is recognized as the date that Congress first voted funds for American warships, the Navy Department, in cooperation with the Navy League of the U.S., has decided the latter date is more appropriate to commemorate the birthday of the Navy. You are encouraged to plan your information campaign ahead signalling 13 Oct as the official date of the celebration.

Sleep Patterns in the Coronary Care Unit

By LCDR Richard M. Deamer, MC, USNR;
Martin Scharf, B.A.; and Anthony Kales, M.D.

Introduction

Reports on supportive treatment for the patient with acute myocardial infarction have increased significantly over the last decade. Much of the literature is anecdotal and subjective, dealing with familiar variables such as patient anxiety over constant EKG monitoring and cardiac arrest.[1] The latter phenomenon and related complications still account for a mortality rate of 24% in one major institution.[2]

As of yet, however, no studies dealing with sleep patterns in the Coronary Care Unit (CCU) have been reported. The CCU nursing staff at UCLA Medical Center customarily describe the sleeping patient in terms of "restless night" or "patient slept well," but no real indication of the quality or quantity of sleep is recorded. Sleep is most likely disturbed by rigid medication schedules including antiarrhythmic agents, or pain may awaken the patient otherwise. In our experience drugs which are known to exert a disruptive influence on sleep patterns,[3] especially REM suppression, continue to be used. Nixon et al.,[4] considering that fear and pain may predispose to cardiac complications in the CCU, induced light sleep with pethidine (meperidine) hydrochloride and promethazine in patients with acute myocardial infarction. No consideration was given to the hypotensive effects of such drugs on an already compromised cardiovascular system and no controls were included to determine the nature of the CCU experience prior to sleep induction.

Since Aserinsky and Kleitman's observation[5] that sleep varies in a biphasic way and Dement and Kleitman's[6] further classification of sleep into five electroencephalographic stages, there has been a continued effort to apply these findings to abnormal physiological states in the human. Sleep is commonly thought of now as being divided between NREM sleep, during which rapid eye movements (REM) are absent, and REM or dreaming sleep, where most of the physiologic changes occur. NREM sleep can be further divided into stages 1 through 4, defined mostly by characteristic changes in the EEG, progressing from a low voltage-mixed frequency pattern in stage 1, to high voltage-slow wave activity in stages 3 and 4. The first REM period occurs after 90 minutes or so of descent from stage 1 through 4. Minor body movements and recurrence of stage 2 generally herald the onset of REM sleep. As a rule, REM will recur perhaps four to six times throughout the rest of the night.

The physiology of the dreaming REM period is complex. For example, Kales et al.[7] demonstrated

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This study was conducted while LCDR Deamer was at the University of California at Los Angeles (UCLA), Center for the Health Sciences. He is now a Staff Psychiatrist, Neuropsychiatric Service, Naval Hospital Camp Pendleton, Calif.

The opinions expressed herein are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or of the naval service at large.

hypersecretion of gastric acid during REM or dream sleep, and Nowlin et al.[8] revealed that there is a definite association of nocturnal angina pectoris with dreaming. In a pilot program we have had the opportunity to study the sleep patterns of a patient confined to the CCU with an acute myocardial infarction. Our long-range goals are to study CCU and post-CCU complications (arrhythmia and infarct extensions) which occur during sleep and to identify any correlations attributable to sleep physiology and disturbances.

Method and Case Report

Through the use of telemetry equipment recently developed for the space program, a four-channel system was employed for monitoring eye movement, muscle tone of the face and two EEG leads. All data was transferred remotely by telephone to a central receiving station in another building.

The patient who volunteered for the study was a 59-year-old married male who was admitted to UCLA for evaluation of substernal squeezing discomfort. Three months prior to admission, he had been hospitalized elsewhere for similar complaints following a tennis game. An electrocardiogram (EKG) obtained then showed abnormalities which cleared in four days and the patient was discharged eight days later. Since then, he had complained of exertional angina relieved with nitroglycerin medication. On the morning of admission to UCLA Medical Center he had awakened with nausea which progressed to severe angina, diaphoresis, and shortness of breath. Two days after admission, repeat EKG and serum enzyme studies were characteristic of a moderately severe, uncomplicated, inferior myocardial infarct.

The patient was monitored for a total of 24 hours over a 36-hour period of time. We regarded the first 12 hours as electrode adaptation time. Technical difficulties prevented us from obtaining a continuous record and although data is presented, it is not truly representative of the sleep cycle for obvious reasons. No technical difficulties were encountered during the subsequent 24-hour span, but we did not record during two four-hour blocks of time because the patient was clinically awake, eating, receiving visitors, etc.

Results

As can be seen from Figure I, our patient experienced a severely distorted sleep cycle over the last 16 hours of EEG recording. The cycle was punctuated by six awakenings, not necessarily precipitated by drug administration although Figure II indicates that Pronestyl (procainamide hydrochloride) 375 mg was received every four hours.

A breakdown of sleep stages is presented in Figure

FIGURE I.

SLEEP STAGES IN 36 HOURS OF RECORDING

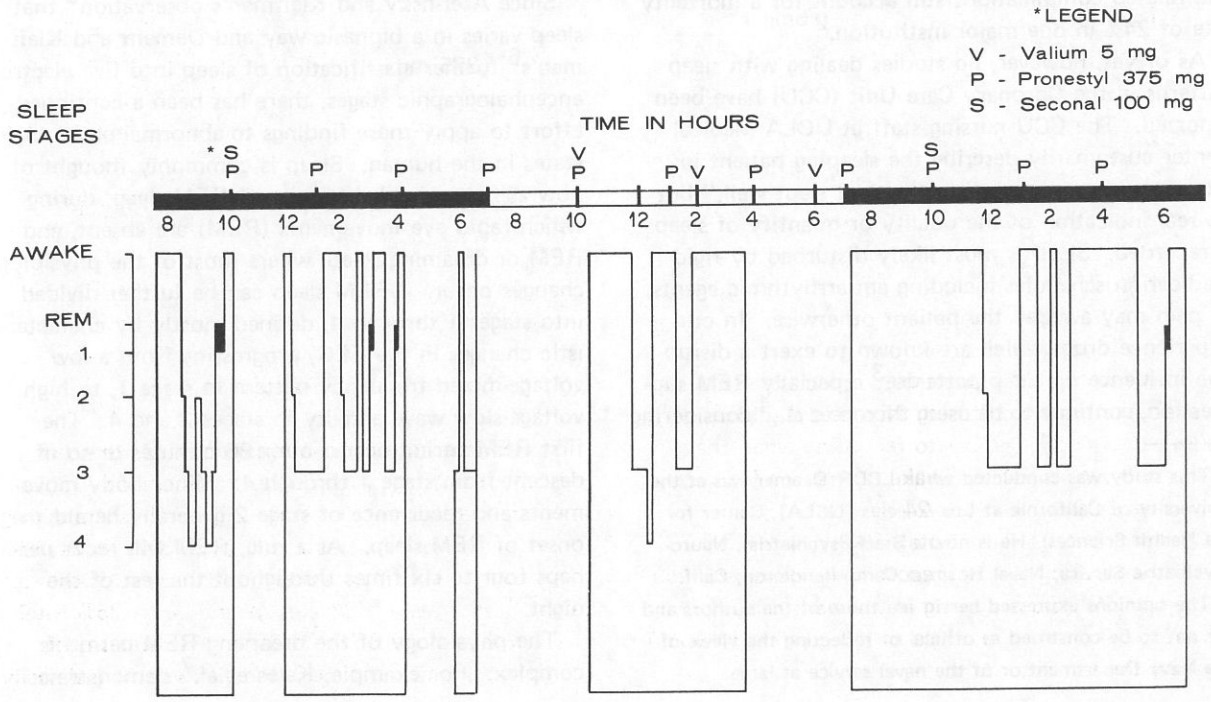

FIGURE II.

MEDICATION RECORD FOR 24 HOURS

Time	*Valium*	*Pronestyl*	*Seconal*
0100		375 mg	
0200			
0300			
0400		375 mg	
0500			
0600			
0700		375 mg	
0800			
0900			
1000	5mg	375 mg	
1100			
1200			
1300		375 mg	
1400	5mg		
1500			
1600		375 mg	
1700			
1800	5mg		
1900		375 mg	
2000			
2100			
2200		375 mg	100 mg
2300			
2400			

III. Interestingly, the patient dreamed more during the initial adaptational monitoring than he did subsequently. Assuming no sleep was lost to recording when the patient appeared clinically awake, he slept a little over four hours during the index 24-hour time span. As can be seen, only 2.7% of total sleep time was spent in dreaming during the last recording – much less than the average 20-25% occurring in normal sleep. There was practically a total absence of sleep in stages 3 and 4 during the last recording.

Discussion

The patient confirmed our expectations that his sleep cycle pattern would be disturbed in the CCU. The fact that he averaged only 2.7% REM sleep during the index 24-hour period also implied that he would go through a REM-rebound effect later in his hospitalization.[9] Normally, a person spends 20 to 25% total sleep time in stage REM.[10] When this amount of dream sleep is not obtained, individuals will ordinarily

FIGURE III.

INITIAL 12-HOUR RECORDING (ELECTRODE ADAPTATION)

Total recording time	–	8 hr.
Total wake time	–	3 hr. 34 min. (44%)
Total sleep time	–	4 hr. 11 min.
Time lost to paper changes	–	15 min.

Stages as Percentages of Total Sleep Time (TST)

Stage	*Minutes*	*% TST*
REM	21	8.3
1	11	24.4
2	183	73.0
3	36	14.3
4	0	0
	Total 251	

SUBSEQUENT 24 HOUR RECORDING

Total recording time	–	16 hr.
Total wake time/16 hr.	–	11 hr. 17 min. (70%)
Total sleep time/16 hr.	–	4 hr. 17 min.
Time lost in paper changes	–	26 min.

Stages as Percentages of Total Sleep Time (TST)

Stage	*Minutes*	*% TST*
REM	7	2.7
1	9	3.5
2	229	89.0
3	12	4.6
4	0	0
	Total 257	

attempt to "make-up" the loss at a later time. Although we had no means of following our patient's course telemetrically after intensive care, he was awakened at seven AM with shortness of breath and diaphoresis two days after transfer to a general hospital ward. There were no associated EKG changes. We speculated that the patient was in a REM-rebound period precipitated perhaps by barbiturate withdrawal, or that he was simply compensating for lost REM-time secondary to prior CCU stresses. Future studies will follow such patients in the immediate post-CCU period in an attempt to verify this supposition. It would seem reasonable to predict at this time that as more REM-rebound is experienced, there is a greater chance for cardiac complications to occur. Other studies[11,12] have shown, for example, that average heart rate and systolic blood pressure measurements increase during dream sleep. In a heart compromised by infarction, such phenomena could conceivably contribute to the development of arrhythmia and other complications in the CCU.

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Many states permit registration by absentee process, while other states will register a qualified voter when they accept a voted absentee ballot. In still others, a voter must be registered before applying for a ballot.

In still others, persons applying for registration or absentee ballots, particularly civilians who temporarily reside overseas, must have initially registered in person in their home country. Procedures vary from State to State and must be understood and followed exactly on an individual basis.

In some states registration is permanent. Where such permanent registration laws are in effect, a person is not required to register for each election so long as he meets certain requirements. In general, the requirements are that the applicant vote regularly and not legally change his name or move away from the area (such as precinct or district) where registered.

Most states permit those under voting age to apply for registration if they will be of legal voting age by the date of the election.

Application for registration should always be made as early as the state permits, especially in cases where registration must be completed before application may be made for the absentee ballot.

For information, see your voting officer.—NAVNEWS, Washington, D.C.

Drug abuse rehabilitation centers have been established at two Naval Air Stations — Miramar, Calif. and Jacksonville, Fla. And, an alcoholic rehabilitation center was recently opened at the Naval Amphibious Base, Little Creek, Va.

"KEEP THEM FLYING SAFELY" ★

The U. S. Navy Special Board of Flight Surgeons

By CAPT M.D. Courtney, MC, USN,
Commanding Officer, Naval Aerospace Medical Institute,
Naval Aerospace Medical Center, Pensacola, Fla.
(Photos by courtesy of J. Dowd, PAO, NAMC, Pensacola)

The text of the following paper was presented by CAPT Courtney at the AGARD (Advisory Group for Aerospace Research and Development) Aerospace Medical Panel Meeting on "Clinical Causes for Grounding" held in Oporto, Portugal, 21-22 June 1971. The article was published in the AGARD Conference Proceedings and is reproduced here with the kind permission of AGARD and the author. Part I of this article appeared in the February issue on pages 32-41.

Otorhinolaryngology

Table 8 is a resume of the cases appearing before the Board with ear, nose, or throat conditions. A wide variety of cases were seen without any significant preponderance of one condition over another. The miscellaneous diagnoses in this group include temporomandibular joint syndrome, tinnitus, perforated tympanic membrane, a postoperative carcinoma of the sinus and orbit, a postoperative fenestration operation, and two cases of allergic rhinitis. The fenestration operation and the postoperative carcinoma cases were recommended for permanent grounding, but the majority of the ENT patients, as can be seen, were returned to some category of flight status, nearly 50% to Service Group I or unrestricted flying.

Orthopedics and Surgical

Tables 9 and 10 show the orthopedic and surgical cases referred to the Board. These were relatively insignificant as to numbers, and the majority of the individuals were returned to a flight status. One, a very interesting case in the orthopedic group, was that of an individual who, as a result of an exceedingly low-level emergency ejection, sustained injuries resulting in bilateral amputation of the lower legs. This individual was highly motivated to return to a flight status; following his rehabilitation, being outfitted with suitable prostheses, he was determined to show all that he could function as well as any individual with two normal legs. He was returned to duty by a medical board and appeared before the Special Board of Flight Surgeons at Pensacola. At that time he was found fit for duty in Service Group III only, but only after considerable deliberation and divided opinion. This recommendation for Service Group III, in which he would have to fly with a pilot qualified either in Service Group I or II, was made with the proviso that the Bureau of Naval Personnel would grant a waiver for the absence of the lower legs, a defect which is ordinarily disqualifying for duty within the U.S. Navy. Of the orthopedic problems, 12 or 52% were related to the back or spine. In fact, two additional cases could be included in this group as two of the five fractures involved compression fractures of vertebrae.

*Part II

Ronald M. Robertson, Ph.D., has joined the staff of the Acoustical Sciences Branch in the Naval Aerospace Medical Research Lab. Former Assistant Professor at the University of Arizona, Dr. Robertson will serve as a principal and associate investigator in the areas of audiology, psychoacoustics and speech communications.

Table 8.—Otorhinolaryngology

	0	1_2	1_3	2	3	4	Total
Defective Hearing	3	1	2	0	3	0	9
Aero-Sinusitis (recurring sinus blocks)	2	0	1	0	1	0	4
Aero-Otitis (recurring ear blocks)	3	0	0	0	0	0	3
Miscellaneous ENT Conditions	9	1	4	0	5	0	19
Total	17	2	7	0	9	0	35

Table 9.—Orthopedics

	0	1_2	1_3	2	3	4	Total
Spinal Abnormality	2	0	1	1	3	0	7
Low Back Strain	3	0	1	0	1	0	5
Fractures	4	0	0	0	1	0	5
Miscellaneous Orthopedic Diagnoses	1	1	2	1	1	0	6
Total	10	1	4	2	6	0	23

Table 10.—Surgical

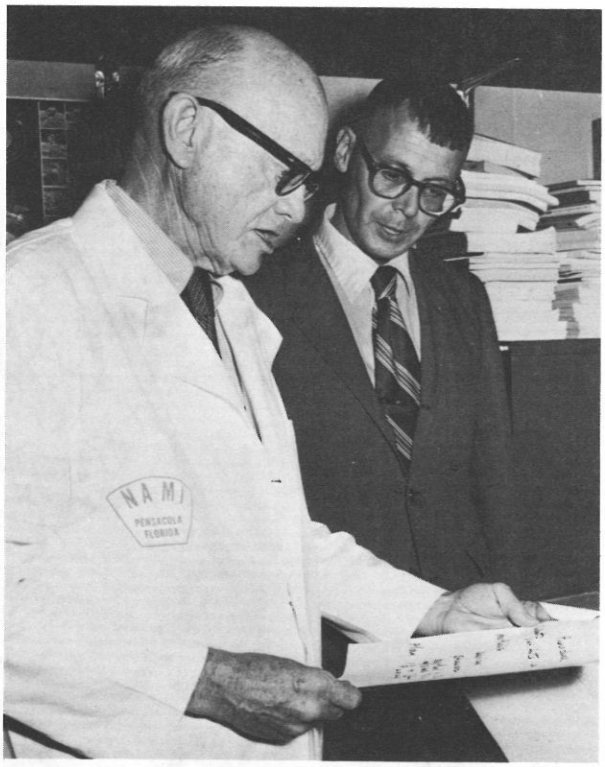
	0	1_2	1_3	2	3	4	Total
Renal Calculi	0	0	1	0	3	0	4
Stone in Ectopic Kidney	1	0	0	1	0	0	2
Carcinoma - Terminal Ileum	2	0	0	0	0	0	2
Seminoma, Rt.	1	0	1	0	0	0	2
Total	4	0	2	1	3	0	10

Resource management and budget officials from BUMED had a demonstration ride in a rotating room during a visit to NAMRL in Pensacola. CAPT Robert E. Mitchell, MC, USN (second from left), Acting Officer in Charge of the Laboratory, accompanied the naval officers inside the rotating Coriolis Acceleration Platform used for disorientation studies. Visitors, standing from left to right, were: CAPT Clifford W. Boggs, MSC, USN; CDR Eugene Bryant, MSC, USN; and CDR Bruce Dietz, MSC, USN.

Table 10 shows all cases with surgical involvement. The ten cases appearing before the Board represented six different individuals. The individual with a stone in an ectopic kidney was initially seen before surgery and was temporarily grounded. He returned for a reevaluation following surgery and was returned to an unrestricted flying status. The cases of carcinoma of the ileum and the seminoma case were initially seen shortly after surgery, and the recommendation in both instances was that they return to the Board for final evaluation after a six-month period. At that time both were returned to an unrestricted flying status. Of the three individuals who presented renal calculi, all were eventually permanently grounded.

Bureau Changes

Table 11 reveals by year the number of recommendations made by the Special Board which were changed by BUMED. It is seen that in the 14 years covered by this report, only 46, or 6.4%, of the dispositions recommended for the 720 cases evaluated by the Special Board were changed by BUMED. Of the dispositions changed by BUMED, 30, or 65%, were made more restrictive and 35% were made less restrictive.



Dr. W.J. Oosterveld (right) of the University of Amsterdam, The Netherlands, visited NAMRL to collaborate with Dr. Ashton Graybiel (left) on a joint research project. Dutch scientists previously spent a year in Pensacola conducting research experiments with Dr. Graybiel.

Table 11.—Special Board Recommendations Changed by Bureau of Medicine and Surgery by Year

Year	Total Cases	BUMED Made More Restrictive	BUMED Made Less Restrictive	Total
1957	11	0	0	0
1958	33	2	1	3
1959	47	0	0	0
1960	53	0	0	0
1961	92	3	1	4
1962	101	4	2	6
1963	75	9	0	9
1964	42	2	5	7
1965	54	1	1	2
1966	44	1	0	1
1967	52	5	2	7
1968	45	2	3	5
1969	37	0	1	1
1970	34	1	0	1
Total	720	30	16	46

FLIGHT SURGEONS

CLASS 71-3

U.S. NAVAL AEROSPACE MEDICAL INSTITUTE

ASST. CLASS LEADER

Mac DONALD

CLASS LEADER

SUCHY

ASST. CLASS LEADER

WILLGRESS

ANDERSON

BARNES

BOWER

CRESS

DEWELL

ESHAM

FESSENDEN

FINNEY

GATES

HAMILL

HANNA

JOHNSON

JOSEPH

KAPLA

MANN

MISCHLER

MORRIS

PRITCHARD

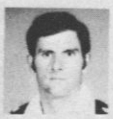
RADKE

RAY

REDWINE

RUBEN

SALTZMAN



SEITZ

SHEERIN

SHERMAN

SOUTHWICK

TARR

TSCHETTER

VEACH

WRIGHT

Table 12.—Recommended Changes by Specialty or Body System

	BUMED Made More Restrictive	BUMED Made Less Restrictive	Total
Cardiovascular	9	10	19
Psychiatry	8	1	9
Neurology	3	1	4
Internal Medicine	4	2	6
Ophthalmology	2	0	2
Otorhinolaryngology	2	2	4
Orthopedics	2	0	2
Surgery	0	0	0
Total	30	16	46

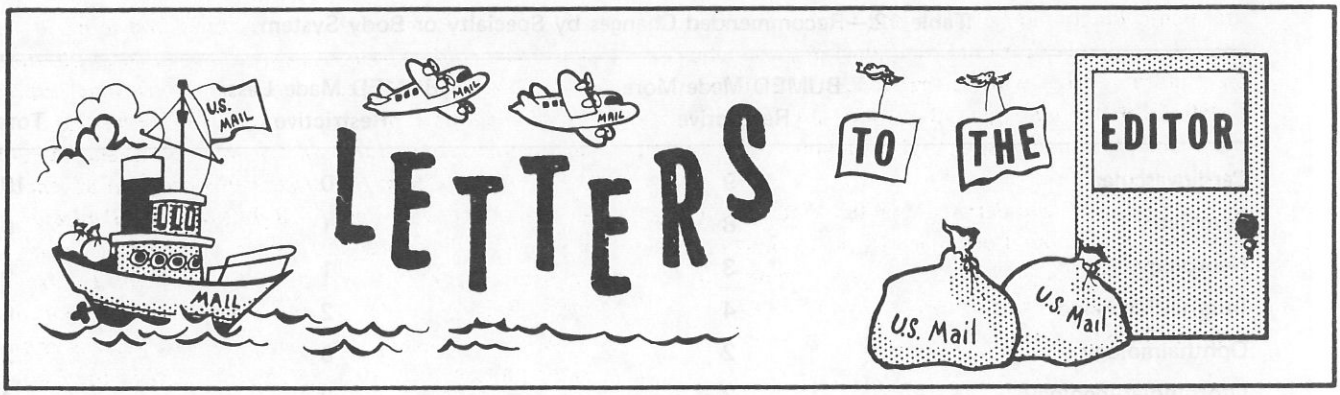
Table 12 again shows the number of Board recommendations changed by BUMED. However, the changes are listed this time according to specialty or body system. It is seen that, in the case of the cardiovascular diagnoses where there were 19, or 41% changes in the recommended disposition, the changes were nearly equally divided between the Bureau increasing or decreasing the flight restriction recommended. By looking at the overall figures, it would appear that the Board was somewhat more lenient in the disposition of cases than was the Bureau, particularly with the psychiatric diagnoses where the Bureau recommended changes on nine occasions, and eight of them were more restrictive in nature.

Discussion

This paper has attempted to present a statistical breakdown of the medical cases appearing before the U.S. Navy Special Board of Flight Surgeons over the period June 1957 through December 1970 and the recommended dispositions that were forwarded to BUMED in those cases. In this study, only designated or qualified pilots are considered. Statistics on 720 cases are presented involving 580 individuals. A breakdown by body system or medical specialty is also presented, showing the most frequent diagnoses encountered. No attempt has been made in this paper to indicate any trends that may have occurred over the years relative to changes in medical causes leading to appearances before the Board, restrictions in flying status, or grounding, nor as to the attitude of the Special Board toward categories of conditions referred to it. It is the intent to conduct such studies in the future, once all the raw data available have been put into a form that allows ready access and analysis.

In reviewing the case history files, it appears that a more lenient position has been taken by the Special Board in the past several years concerning psychiatric cases. Changes in the types of disposition in some cardiovascular conditions have also been evident. These areas certainly deserve more study. The material available in the Board's files, if adequately analyzed, can prove beneficial to future Board members and to all aviation medical persons who are charged with the responsibility of medically evaluating the physical qualifications and aeronautical adaptability of flight personnel to safely continue in a flying status.

The Navy's Special Board of Flight Surgeons is in no sense an administrative or investigative body. Its mission and purpose is to "Keep Them Flying Safely."



To the Editor: The December 1971 issue of US NAVY MEDICINE has a letter from LT J.R. Woodside, MC, USNR, affirming that he is primarily a physician and secondly an officer, although his name at the letter's end is signed "LT." I do not agree with him.

The basic duty of every member of our armed forces, line and staff, is to aid the command in gaining success in battle. There are times when military physicians must return patients to action, and perhaps assume other noncombatant emergency duties where only the non-questioned authority of a commissioned officer can prevail.

I think I have a measure of background for my opinion. I saw some actual combat service in WW I as an infantry platoon leader, and in WW II as a flight surgeon with an attack aircraft carrier. That kind of experience makes a doctor reexamine his privileged civilian positions and accept willingly his honored dual responsibilities in the armed forces as an officer, first, and as a physician, with no loss of care or compassion for all hands.

CAPT Charles C. Yanquell, MC, USN (Ret.)
563 Alameda Boulevard
Coronado, Calif. 92118

To the Editor: It has taken awhile *(2 months apparently – ed.)* for the October issue of US NAVY MEDICINE to wander down to this particular outpost. One must suppose that CDR William M. McDermott, MC, USN, much prefers the appellation "Commander" to "Doctor" in his relations with patients. Unless he were a line officer before obtaining his M.D., it is difficult to comprehend why he is "first and foremost a naval officer and secondly a physician." Perhaps this is fact, insured by some pronouncement from Navy regulations, but a quick survey locally suggests that his opinion is not widely shared. There are surely many reasons why one is first a physician and, only incidentally, a naval officer, but the paramount one concerns the stress placed on the traditional physician-patient relationship, particularly by the high-ranking physician.

And, in further comment, I am glad to learn that junior medical officers are allowed to participate in formulation of administrative policy. I trust that the implementation of this will come soon, for I have had the distinct impression that formulation occurs at the four-stripe level and above – and not for want of proffered opinion and statistics from junior officers.

LT A. Sidney Barritt, III, MC, USNR
Naval Air Station
Imperial Beach, Calif. 92032

Two months does seem like a long time to wait for US NAVY MEDICINE. Do all of our readers on the west coast have to wait that long? We would like to know, in order to improve distribution.

We don't know why exactly, Dr. Barritt, but somehow we like your style and would like to leave you on an optimistic note. Though not always identified by gold on their coat sleeves, "four-stripers" seem to infiltrate all medical communities, civilian and military. In not too many years hence, you yourself will be joining their ranks, somewhere. Cheers!

To the Editor: As a regular reader of US NAVY MEDICINE, I find most of the material printed interesting and informative. However, the comments on oral penicillin printed under "Formulary Notes" (Vol 58:39, Oct. 1971) detract from the value of a medical newsletter which could serve as a means of disseminating pertinent information.

Apparently, the BUMED Formulary Committee would prefer substitution of a preparation that is less well and variably absorbed under ideal circumstances to one that is more constant in absorption and can be taken without regard to food in the stomach for a 26% cost savings.

The BUMED Consultant in Pediatrics notes when

oral penicillin should be taken and further recommends a strong educational program for those who see children. What was his first recommendation? I differ with the statement that most physicians do not realize that phenoxymethyl penicillin is the more expensive product.

In summary, I wonder if this is the kind of information upon which our Formulary Review Committee bases its decisions? If so, I think our unique ability to deliver excellent health care in the Naval System is in jeopardy.

CDR T.E. Carson, MC, USN
Naval Hospital, Oakland, Calif.

Ref: 1. *The Pharmacological Basis of Therapeutics,* Fourth Edition, New York, Macmillan.
2. *Drill's Pharmacology in Medicine,* Third Edition, New York, McGraw-Hill.

The foregoing letter has been referred for comment to the Chairman of the Formulary Review Committee, and Pediatric consultants. Their prompt and considered replies follow:

The Formulary Note referred to by Dr. Carson was intended as a plea for physicians to tailor the antibiotic to the needs of the patient and incidentally to save money. As I reread the Note, I must admit that the emphasis is on savings and I apologize for this.

Antibiotic prescribing in my own experience is much more rational and restrained now than it was five years ago, but there is still a tendency to use an antibiotic when none is needed, or to use a large dose when a small one will do the job. Penicillin G tablets when given in the proper manner and for a susceptible organism are as effective as phenoxymethyl penicillin and cheaper.

CAPT L.M. Fox, MC, USN
Chairman, Formulary Review Committee

The following comments present a view of both sides of the argument and may offer some physicians a clearer basis for forming their own opinion:

a) When penicillin G tablets are prescribed there is a substantial savings – closer to 50% than to 26%, $0.80 vs 0.40 for 40 tablets. This is not true of suspensions in which case penicillin G costs more than 2½ times as much as penicillin V. Therefore whether or not pen G is cheaper than pen V depends on the form in which it is prescribed. We can really save money by teaching physicians when not to administer antibiotics.

b) "Equal effectiveness" is a misleading term, in that most clinical trials of penicillin vs other antibiotics are related to streptococcal disease, which may not be an accurate reflection of relative effectiveness against other organisms. McCarthy and Finland (NEJM 263:7:316, 18 Aug 60) discuss this problem at length; Edmond, et al., (J. Ped. 68:3:442 March 66) nicely summarize their own and others' comparative trials between G and V. Properly used, penicillin G is as effective as penicillin V, even though the peak serum level as well as peak effective inhibitory level is considerably greater for the latter. At least in the case of streptococcal pharyngitis the "poorer" absorption of pen G may not be detrimental because of the somewhat larger "area under the curve."

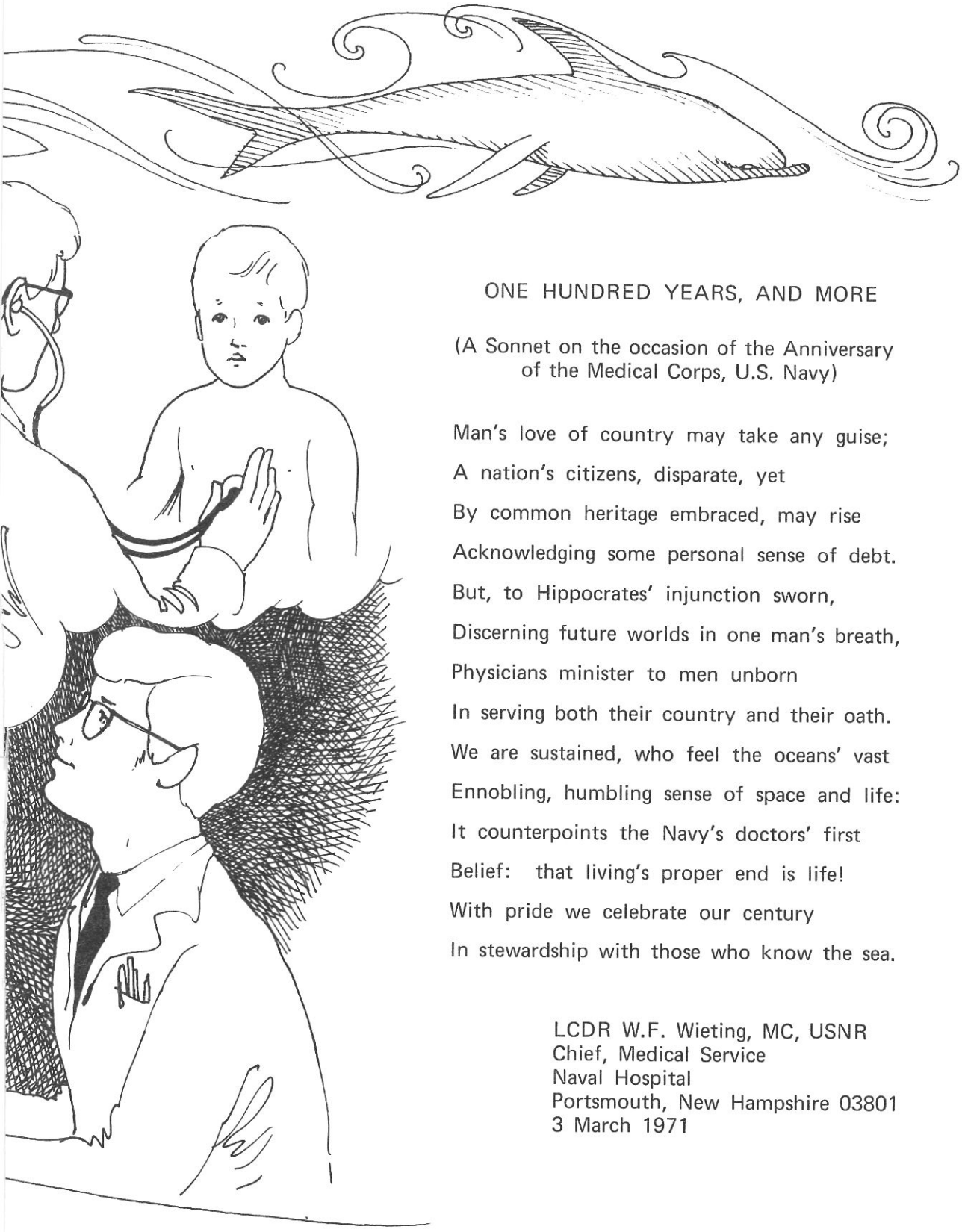
c) The main argument against substitution is patient compliance. Cherrey, et al., (Peds 40:2:188 Aug 68) have attempted to place the compliance factor and therapeutic trials in proper perspective. Although they dealt with children, their conclusions are probably valid when applied to adults – as any physician who has himself been treated for streptococcal pharyngitis can testify. It is difficult enough to remember to take an oral medication for ten days. It is even more difficult, if not impossible for most of us, to remember to take it at specific times in relation to meals.

In the past, we have encountered a few topics which generate emotional presentations that far outweigh the practical consequences of the argument. To these we shall now add the controversy between pen G and pen V.

Hopefully the above comments will answer CDR T.E. Carson's questions. The Formulary Review Committee bases its decisions on accurate information and expert consultations where indicated. We would like to reassure CDR Carson that the delivery of excellent health care services to our Navy community is not in jeopardy! We would also like to reassure him that pen V will remain on the supply table.

CAPT M. Museles, MC, USN, and
CDR P.J. Goscienski, MC, USN.

To Our Readers: Many letters are erroneously mailed to our distribution center in Philadelphia. U.S. Naval Publications and Forms Center in Philadelphia is concerned only with requests that pertain to mailing addresses. In accordance with the instructions printed on the inside back cover, all correspondence concerning U.S. NAVY MEDICINE content and contributions should be addressed to the Editor, Code 18, Bureau of Medicine and Surgery, Navy Dept., Washington, D.C. 20390.



ONE HUNDRED YEARS, AND MORE

(A Sonnet on the occasion of the Anniversary of the Medical Corps, U.S. Navy)

Man's love of country may take any guise;
A nation's citizens, disparate, yet
By common heritage embraced, may rise
Acknowledging some personal sense of debt.
But, to Hippocrates' injunction sworn,
Discerning future worlds in one man's breath,
Physicians minister to men unborn
In serving both their country and their oath.
We are sustained, who feel the oceans' vast
Ennobling, humbling sense of space and life:
It counterpoints the Navy's doctors' first
Belief: that living's proper end is life!
With pride we celebrate our century
In stewardship with those who know the sea.

LCDR W.F. Wieting, MC, USNR
Chief, Medical Service
Naval Hospital
Portsmouth, New Hampshire 03801
3 March 1971

THE CARDIOLOGISTS' CORNER

Laboratory Evaluation of Angina Pectoris: Pathophysiological Considerations

By LCDR Carl L. Pepine, MC, USN, Cardiopulmonary Branch, Medical Service, Naval Hospital Philadelphia, Pa., and; CDR Carl R. Bemiller, MC, USN, Head, Cardiopulmonary Branch, Medical Service, Naval Hospital Philadelphia, Pa.

"Laboratory methods as applied to the study of clinical medicine have come to stay; instruments and methods of precision are gradually relieving medicine of its past stigma; they are lifting it to the plane of its sister sciences, its true and proper status. We have been too content in the past with opinion. In the future, we shall rest our case upon fact."

(Sir Thomas Lewis, 1915)

Evaluation of patients with suspected angina pectoris depends primarily upon the history (as indicated in our first article in this series, U.S. NAVY MEDICINE 58: 12-16, Dec 1971), physical examination, and electrocardiogram. However, information derived from these sources is often inadequate. Since coronary artery disease (CAD) is frequently silent or its clinical appearance disguised (i.e. anginal equivalent), all too often the first recognized clinical manifestation of the disease is sudden death. In addition, the quixotic course of CAD ranging from asymptomatic periods to anginal episodes, to myocardial infarction with complications, continues to provide a diagnostic and therapeutic enigma to physicians. But a "wait and see attitude" can no longer be justified. It is becoming increasingly apparent that special laboratory studies are required to approach any degree of confidence that such patients are being managed in the best possible way. The developments responsible for altering the clinical approach to this disease are the application of selective coronary arteriography and direct myocardial revascularization surgery.

The purpose of this part of our review is to discuss laboratory evaluation of the patient with suspected angina pectoris and CAD, with emphasis on areas which have clarified the pathophysiology of myocardial ischemia. Understanding these concepts permits a more accurate evaluation of patients with CAD and helps to determine how they should be managed. Since the value of the electrocardiogram in CAD is

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The opinions expressed herein are those of the authors and cannot be construed as reflecting the views of the Navy Department or of the naval service at large.

Please send reprint requests and correspondence to Dr. Pepine at Naval Hospital Philadelphia, Pa. 19145.

fundamental and has been reviewed in detail elsewhere,[1] we will exclude this consideration from the present discussion.

Basic observations in the anginal patient can be divided into those concerned with: (1) definition of coronary and left ventricular anatomy (selective coronary and left ventricular angiography), and (2) evaluation of left ventricular function in the presence of CAD. To appreciate the potential usefulness of these data it is essential to understand that acute myocardial ischemia results when cardiac oxygen requirements exceed the ability of a diseased coronary circulation to deliver oxygen to areas of functioning myocardium. Under these conditions, electrocardiographic S-T segment depression and abnormal myocardial utilization of anaerobic pathways regularly occur. Angina pectoris, however, is not always experienced and the explanation for this finding is not readily apparent.[2]

Hemodynamics

Abnormal hemodynamic responses are consistently observed during myocardial ischemia associated with angina pectoris. During exercise-induced angina a sudden increase in left ventricular filling pressure occurs as myocardial oxygen requirements, reflected by increases in heart rate, rate of development of left ventricular pressure (dp/dt), and systolic pressure are augmented.[3] During spontaneous angina pectoris, left ventricular end diastolic pressure is also consistently raised in association with anginal discomfort. (Figure 1)

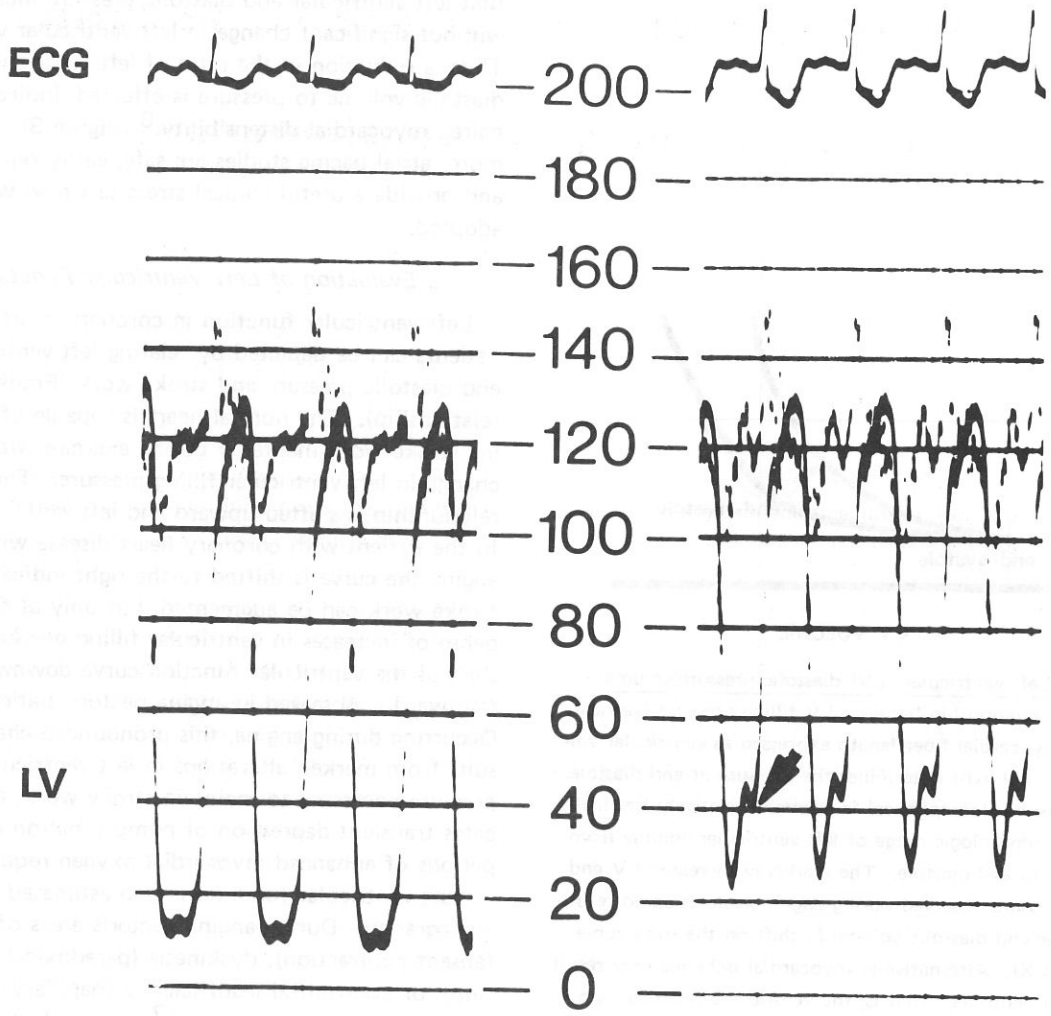


Figure 1.—Changes in left ventricular (LV) filling pressure associated with angina pectoris. Control LV pressure and electrocardiographic lead V_5 are shown at left. During spontaneous angina pectoris, at right, LV end diastolic pressure ( ) increases to 42 mm Hg associated with S-T segment depression. When angina was relieved, LV end diastolic pressure returned to control values.

Other circulatory events associated with this increased end diastolic pressure include: a rise in left atrial and pulmonary pressures, altered contour of the p wave of the electrocardiogram, an increase in presystolic chest wall movement (large "A wave"), increased atrial component on the phonocardiogram, and a loud fourth heart sound (S_4) at the cardiac apex.[4] These consequences are the result of transient elevation of left ventricular end diastolic pressure, but are dissimilar from increased end diastolic pressure typical of usual congestive heart failure.

There are two possible explanations for this sudden change in left ventricular filling pressure. First, there is an abrupt increase in left ventricular volume and the left ventricle is filled to a steep portion of its pressure-volume curve; thus, increased filling pressure would reflect an enlarged left ventricle. (Figure 2) Second, the pressure-volume relationship or distensibility characteristics (compliance) of the left ventricle are acutely, yet transiently, altered during myocardial ischemia. Current evidence suggests that decreased distensibility is the most likely explanation for altered hemodynamics during angina.

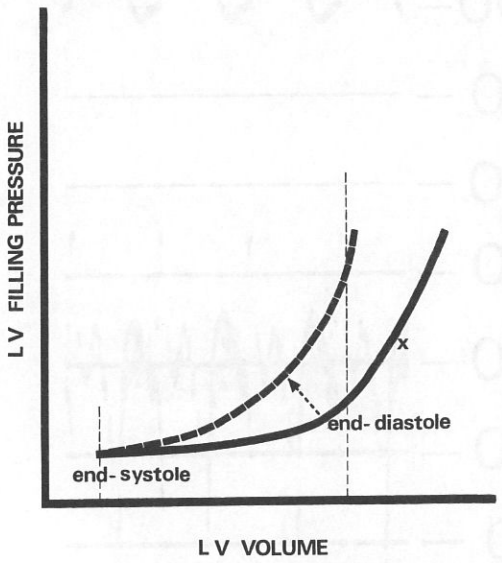


Figure 2.—Left ventricular (LV) diastolic pressure-volume curve. The relationship between LV filling pressure (vertical axis) and myocardial fiber length expressed as ventricular volume (horizontal axis) determines the pressure at end diastole. This relationship (compliance) is normally relatively flat (solid line) in the physiologic range of left ventricular volume from end systole to end diastole. The markedly increased LV end diastolic pressure observed during angina pectoris could result from a large end diastolic volume (a shift on the solid curve to the right X). Alternatively, myocardial ischemia may result in a "stiffer ventricle," that is, the ventricle is filled to its normal end diastolic volume only by development of an elevated end diastolic pressure. This transient change (↖) to a reduced compliance curve (dotted line) is the most likely explanation for the altered hemodynamics associated with angina pectoris and does not necessarily represent heart failure.

Development of atrial pacing techniques for evaluation of cardiac disease enables us to selectively alter myocardial oxygen requirements, evoking angina pectoris while confusing effects of exercise, changes in peripheral circulation, or drug action are eliminated.[5] During pacing-induced angina pectoris we have found that left ventricular end diastolic pressure increases without significant change in left ventricular volume. Thus, a reduction in the ratio of left ventricular end diastolic volume to pressure is effected, indicating impaired myocardial distensibility.[6] (Figure 3) Furthermore, atrial pacing studies are safe, easily reproducible, and provide a useful clinical stress test now widely adopted.

Evaluation of Left Ventricular Function

Left ventricular function in coronary heart disease patients can be depicted by relating left ventricular end diastolic pressure and stroke work (Frank-Starling relationship). The normal heart is capable of augmenting stroke work markedly during exercise with little change in left ventricular filling pressure. Thus, this relationship is shifted upward and leftward. (Figure 4) In the patient with coronary heart disease without angina the curve is shifted to the right indicating that stroke work can be augmented, but only at the expense of increases in ventricular filling pressure. A shift of the ventricular function curve downward and rightward is observed in angina pectoris patients. Occurring during angina, this pronounced change results from marked alterations in left ventricular filling pressure necessary to maintain stroke work, and indicates transient depression of pump function during periods of enhanced myocardial oxygen requirements.

Left ventricular function is also estimated by cine angiography. During angina pectoris areas of akinesis (absent contraction), dyskinesis (paradoxical expansion), or even mitral insufficiency (papillary muscle dysfunction) can be observed.[7] These changes account for clinical signs of abnormal precordial impulses or a mid – late systolic murmur frequently observed during an episode of angina pectoris.[8] With alteration of ventricular contraction, mechanical systole may be

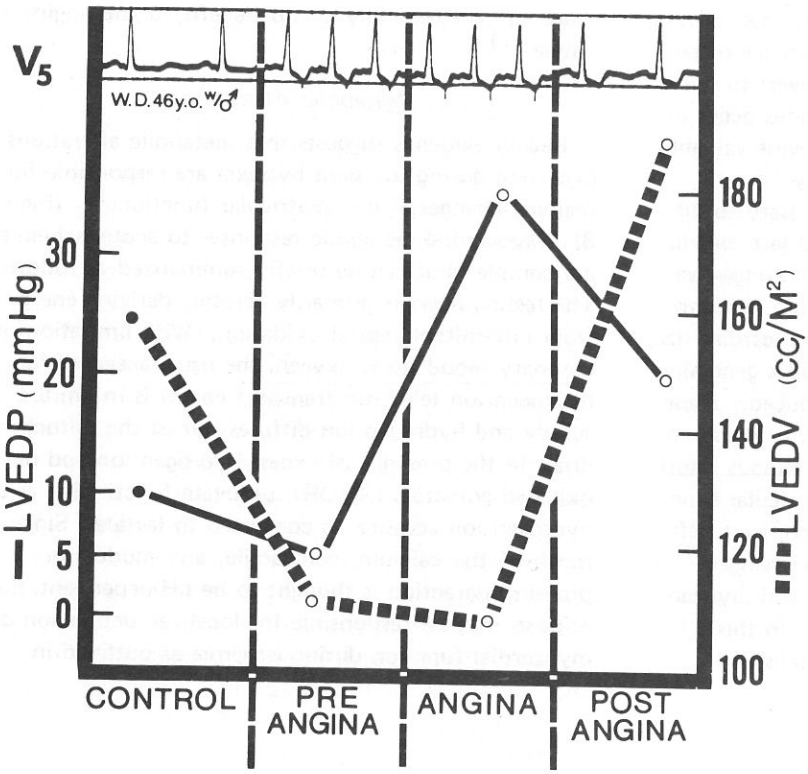


Figure 3.—Left ventricular response to pacing-induced angina pectoris. Left ventricular end diastolic pressure (LVEDP), solid line, and volume (LVEDV), dotted line, decrease during atrial pacing since tachycardia reduces time available for ventricular filling (pre-angina). As myocardial oxygen requirements exceed the ability of this patient's diseased coronary circulation to deliver oxygen to areas of functioning myocardium, electrocardiographic evidence of ischemia appears in lead V_5 (upper panel). Shortly after this ECG change, the patient experiences angina pectoris which is associated with a sudden increase in LVEDP while LVEDV remains at pre-anginal values. These changes indicate alteration in diastolic distensibility of the left ventricle, during angina, which returns toward control values in the postanginal period.

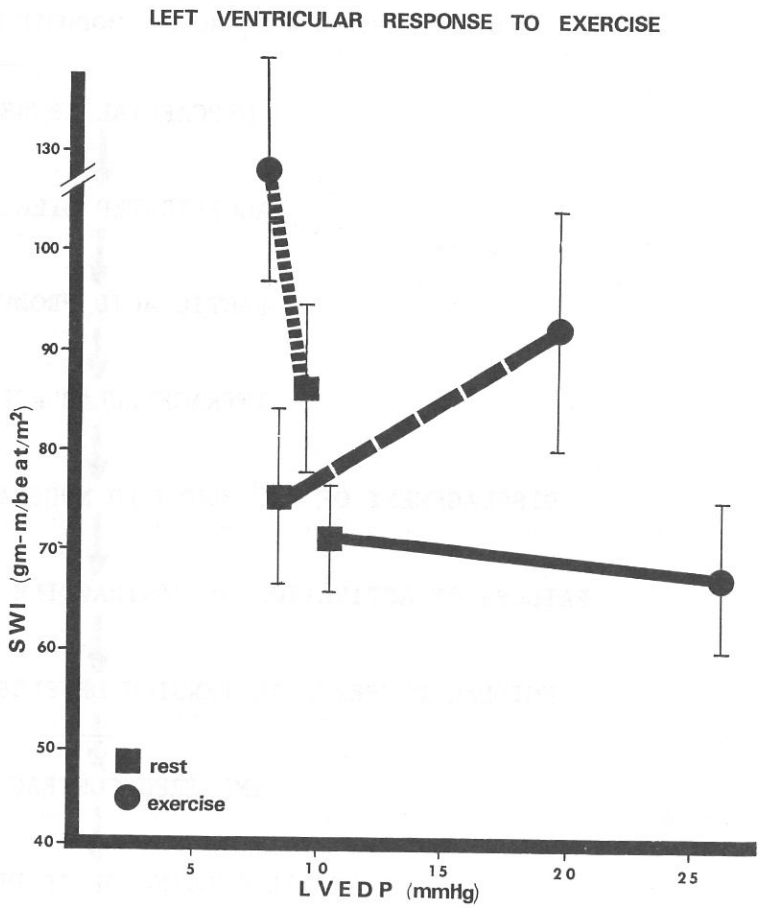


Figure 4.—Left ventricular response to exercise. The relation between left ventricular end diastolic pressure (LVEDP) and stroke work index (SWI) is depicted in the normal heart (narrow dotted line), and in coronary heart disease with angina (solid line) and without angina (heavy dotted line in middle position). In the normal heart, the stress of exercise shifts this function curve upward and leftward. A shift of the curve downward and to the right is observed in patients with coronary heart disease without angina. This shift is much more pronounced in the presence of angina pectoris (solid line) because of the marked increase in LVEDP necessary to maintain SWI.

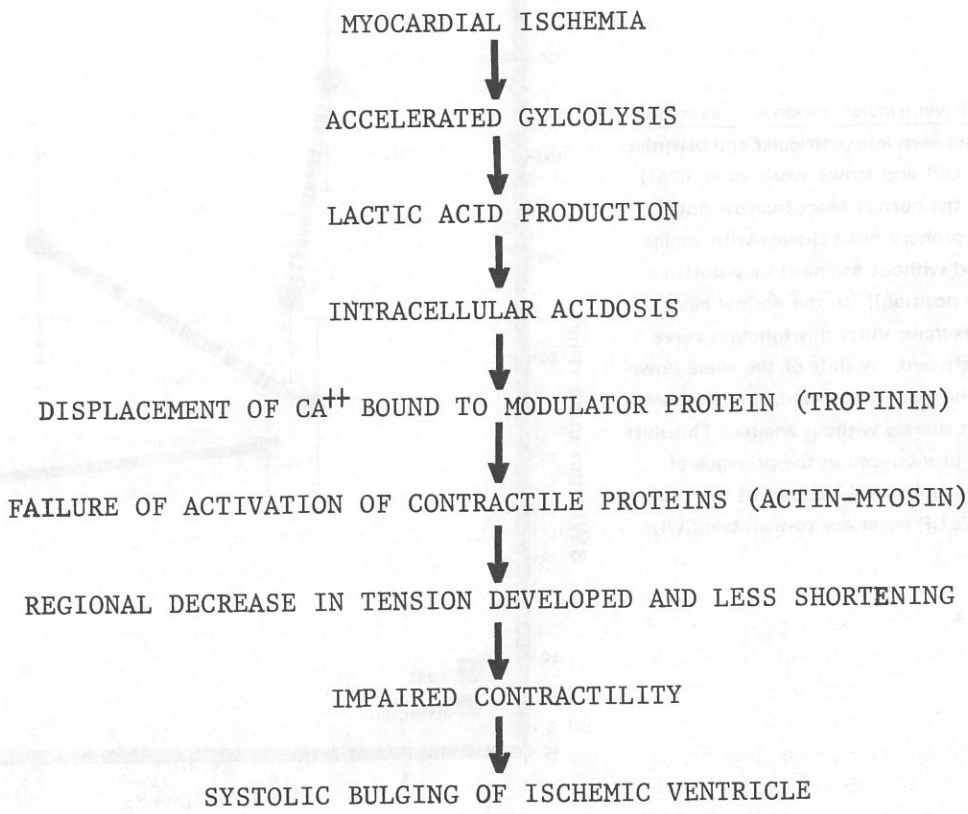
prolonged resulting in abnormal or paradoxical splitting of the second heart sound, even in the absence of conduction defects.[9] These changes often revert to normal. One or more of these physical findings occur in about one-half of angina patients and provide valuable diagnostic clues based on pathophysiology.[10]

From a clinical point of view it is necessary to differentiate between this form of depressed left ventricular performance and that associated with congestive heart failure. With clinical left heart failure, left ventricular volume is increased; with increased cardiac size, a third heart sound (protodiastolic gallop) is generally heard, and myocardial contractility is reduced. These changes usually respond promptly to agents which enhance contractility (digitalis) and reduce venous return (diuretic). In cases of depressed left ventricular function associated with angina pectoris, by contrast, left ventricular volume and cardiac size are unchanged.[7] A third heart sound is generally not heard, and myocardial contractility may be even enhanced. In this setting, usual anti-congestive measures (digitalis and diuretics) are generally of no benefit to the angina patient.[11]

Metabolic Alterations

Recent evidence suggests that metabolic alterations occurring during transient hypoxia are responsible for regional changes in left ventricular function.[12] (Figure 5) Myocardial metabolic responses to acute ischemia are complex but can be briefly summarized as follows: The resting heart is primarily aerobic, deriving energy from intramitochondrial oxidation. With limitation of coronary blood flow, oxygen, the usual acceptor for hydrogen ion (electron transport chain) is in limited supply and hydrogen ion diffuses out of the mitochondria. In the presence of excess hydrogen ion and unoxidized cofactors (NADH), pyruvate functioning as a hydrogen ion acceptor is converted to lactate. Since much of the calcium, contractile, and modulator protein interaction is thought to be pH-dependent, this acidosis may be responsible for localized depression of myocardial function during ischemia as outlined in

Figure 5.—POSSIBLE MECHANISM RESPONSIBLE FOR REGIONAL SYSTOLIC BULGING OF ACUTELY ISCHEMIC MYOCARDIUM. MODIFIED FROM KATZ AND HECHT[12]



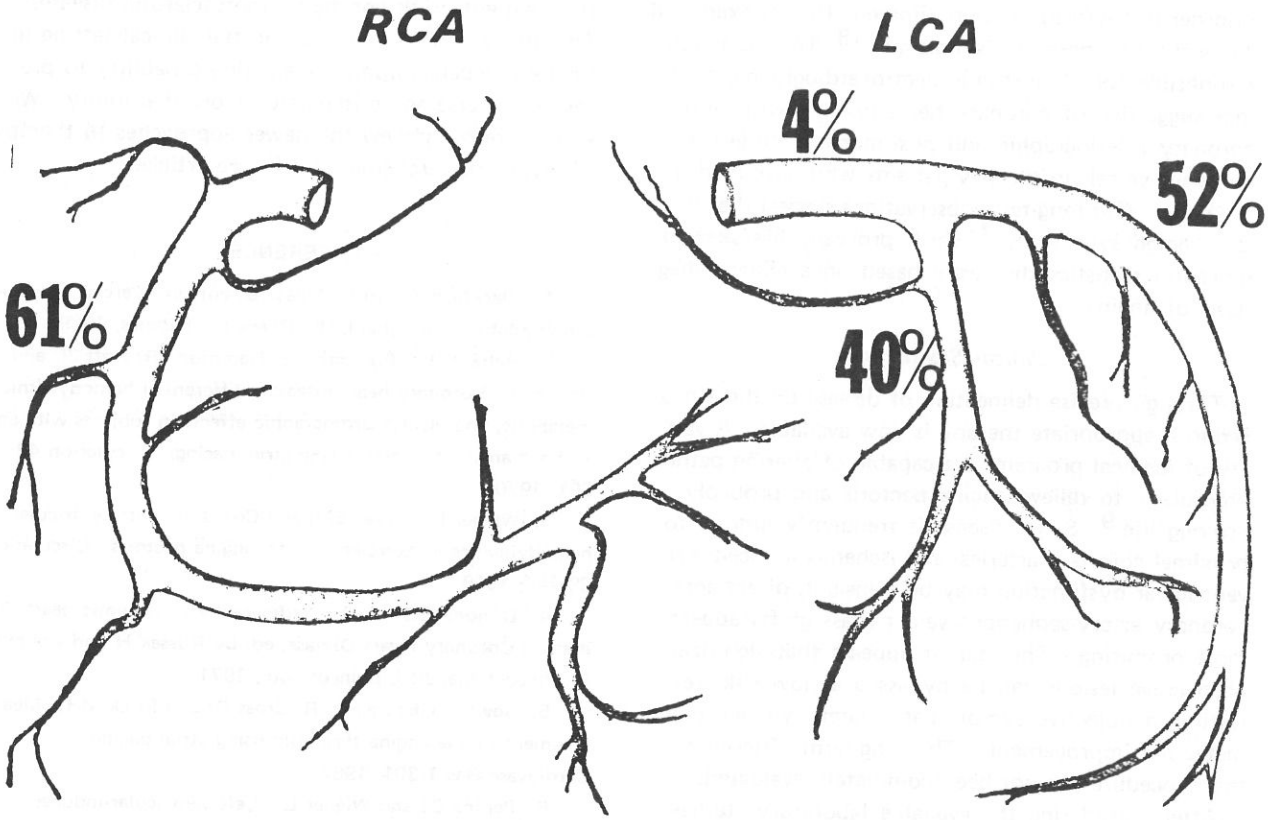


Figure 6.—Coronary arteriographic findings in 100 consecutive CAD patients (mean age 41 years) with angina pectoris. Significant lesions (> 50% narrowing) were present in at least two of the four major coronary divisions in 71% of the series. The frequency distribution of involvement is illustrated above. (RCA = right coronary artery, LCA = left coronary artery) We must emphasize that our military series probably does not represent a true sampling of CAD population.

Figure 5. The coronary arterial lumen must be narrowed by greater than 50% before coronary blood flow is limited significantly, to alter hemodynamic or metabolic performance.[13]

Coronary Artery Anatomy

Selective coronary arteriography offers a means of identification and localization of obstructive disease responsible for the impaired performance. Patients with angina pectoris usually have significant narrowing of more than one major coronary artery. In patients examined in our laboratory, CAD is most common in the proximal and intermediate portions of the right coronary artery. (Figure 6) Since the right coronary artery supplies the inferior left ventricular and septal myocardium in over 90% of cases, gives origin to the sinus node branch in 60% and to the AV node artery in 90% of cases, this localization of CAD is extremely important.[14] The next most frequently involved area is the proximal anterior descending branch of the left coronary artery. Significant obstructive lesions involving the distal right and left coronary arteries are less frequent and disease of the main left coronary artery is infrequent. The coronary arteriogram is said to underestimate the extent of atherosclerotic changes,[15] yet this may result from disease progression during the time between coronary arteriography and autopsy, or lack of distending pressure in postmortem specimens. In our experience, true false-negative angiograms are exceedingly unusual and there has been excellent agreement with the findings at surgery when arteriograms are of good quality, performed in multiple projections.

Coronary arteriography has identified a group of patients with chest pain and evidence of ischemia (electrocardiographic or myocardial metabolic), normally patent coronary arteries, and no other cardiovascular disorders.[16] Initial reports indicated that the majority of these individuals had classical angina and were women. Studies in our laboratory demonstrate that these findings are also common in men and that their chest discomfort tends to be atypical.[17] This

disorder is observed in approximately 10% of examined patients with chest pain syndromes.[18] The mechanism responsible for clinical and electrocardiographic findings suggestive of coronary heart disease, with normal coronary arteriographic and post-mortem studies of coronary vessels in the few patients who have died, is unknown. Our long-term observations suggest that this is a benign syndrome,[17] which probably has skewed mortality statistics that were based on a clinical diagnosis of angina.

Clinical Significance

Through precise delineation of disease by these procedures, appropriate therapy is now available. A variety of medical programs are capable of altering pathophysiology to relieve angina pectoris and probably prolong life.[9] Since disease is frequently limited to proximal coronary arteries, and ischemia-induced left ventricular dysfunction may be transient, direct aorto-coronary artery-saphenous vein bypass grafts appear most promising. Thus far, it appears that significant obstructive lesions can be bypassed at low risk, resulting in objective symptomatic, hemodynamic and metabolic improvement. The long-term efficacy of this procedure has not been completely evaluated.

After considering the available laboratory studies which aid in evaluating the angina patient and a concept of pathophysiologic mechanisms associated with angina pectoris, we conclude by outlining indications for these studies. The indications can be divided into three broad categories: diagnostic, selection of candidates for therapy, and clinical investigation. Such studies may prove extremely useful in evaluation of: atypical chest pain syndromes in the face of normal electrocardiograms, or an atypical electrocardiogram in an asymptomatic patient; unusual conditions of coronary vessels such as abnormal origin, arteriovenous fistula, myocardial trauma, or tumors; preoperative work-up of patients with angina and valvular disease; unusual coronary artery distribution which may be associated with congenital heart disease. The indications for comprehensive study in selection of patients for therapy include those patients with: incapacitating angina that is relatively refractory to usual medical therapy; myocardial aneurysms with refractory arrhythmias or congestive heart failure; symptoms of coronary heart disease in young patients (under 35 years). For clinical investigation, the indications vary from evaluation of the natural history of CAD to objective appraisal of therapy.

Hopefully, this review of newer approaches to the evaluation of patients with angina pectoris may eventually enable us to categorize and more accurately treat patients with coronary atherosclerotic disease. The utility of these concepts in the clinical setting ultimately depends upon the existing capability to prevent or reverse acute ischemic myocardial injury. We shall therefore review the newer approaches to therapy of myocardial ischemia in a future article.

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Mary Kay Backer was sworn into the Navy Nurse Candidate Program on 10 Feb 1972. She will commence active duty as a nurse in Dec 1972, and is a senior student in the degree nursing program, University of Missouri, Columbia, Mo. Officiating at the ceremony is Mary Kay's father, CAPT M.H. Backer, Jr., MC, USNR, Staff Medical Officer NRG 9-34. CAPT Backer has served as a Commandant's Representative on the faculty of St. Louis University since 1957.

The Department Excellence Award, "Blue M," was bestowed on the Medical Dept. in USS SARATOGA (CVA-60) by the ship's Commanding Officer, for standing "first in the class" at the conclusion of the competitive period 1 Jan 1970 through 30 June 1971. Contributing to the spirit and effort which established SARATOGA's Medical Dept. in the forefront of all other Atlantic Fleet carriers were: CDR Harold M. Braswell, MC, USN, Senior Medical Officer; LCDR Michael L. Gelfand, MC, USNR, Assistant Medical Officer, and; LT Cloyd J. Parker, MSC, USN, Medical Administrative Officer.

THE FIRST CENTURY

At Guantanamo Bay

The 100th anniversary of the Navy Medical Corps was celebrated on 5 March 1971 at the Officers' Club, US Naval Base, Guantanamo Bay, Cuba. The Naval Hospital staff was joined by many invited guests from the Naval Base. Cutting the cake are, from left to right: LT K.E. McCracken, MC, USN, Nav Hosp GTMO; RADM B. McCauley, USN, CO NAV BASE GTMO, and; CAPT J.A. Long, MC, USN, CO Nav Hosp GTMO.

In London

The US Navy Medical Corps received a "happy birthday" toast from top British military medical officers during a celebration on 5 March 1971 at The Dorchester in London. The celebration marked the 100th Anniversary of the Medical Corps on 3 March. In top photo, CAPT Almon C. Wilson, MC, USN, (right), Fleet Medical Officer on the staff of the Commander in Chief, US Naval Forces, Europe is pictured receiving the toast. The British officers are, left to right: Surgeon Vice Admiral E.B. Bradbury, RN, Medical Director General, Royal Navy; Surgeon Air Marshal E. Sidey, RAF, Medical Director General, Royal Air Force; and Surgeon General Sir Norman Talbot, RAMC Medical Director General, British Army.—PAO, Commander in Chief, US Naval Forces, Europe.

In Honolulu

Former Fleet Medical Officer Commander in Chief, U.S. Pacific Fleet, RADM Frank B. Voris, MC, USN, now retired, (right) and ENS Williams (left), prospective Medical Corps Officer – 1915, cut the cake in the familiar youngest – oldest tradition.

In Barstow, California

At the Marine Corps Supply Center Officers' Club in Barstow, Calif., an anniversary dinner honoring the Navy Medical Corps was held on 3 March 1971. Cutting the cake is BRIG GEN Harry C. Olson, USMC, Commanding General MCSC. Observing the ceremony are, from left to right: LT Alan S. Robbins, MC, USNR; LCDR Frederick Y.F. Ng, MC, USNR; CAPT Ernest F. Latham, MC, USN, Senior Medical Officer, and; City of Barstow Mayor, Bernard Keller (seated).

Force Surgeon, Fleet Marine Force, Pacific, CAPT R.E. Luehrs, MC, USN (center) and Mrs. Luehrs (left), share observance of the Medical Corps birthday with Mrs. V.G. Kreck (right).

In Western Australia

At the US Naval Communication Station, Harold E. Holt, Exmouth, Western Australia where the Medical Department consists of two doctors, two nurses and six hospital corpsmen, a joint birthday celebration was held in honor of the 63rd Nurse Corps and 100th Medical Corps anniversaries. Cutting the cake, from left to right, are: LT D.R. Phillip, NC, USN; LT M. McGough, NC, USNR; LT J.G. Knepper, MC, USNR, and; LT L. Thomas, MC, USNR.

In Washington, D.C.

Have a happy 101st birthday. (Send pics!)

Medical and Surgical Report of the Case of President McKinley

By Presley M. Rixey, Medical Inspector, U S Navy (dec.)

In the annual Report of the US Navy Surgeon General, to the Secretary of the Navy in 1901, there appears a special "Medical and Surgical Report of the Case of the Late President of the United States," by Presley M. Rixey, Medical Inspector, US Navy. This medical account of the fatal wounding of President McKinley is reprinted here in a slightly abridged form.

William McKinley, President of the United States. Born January 29, 1843. Native of Ohio. Gunshot wound of abdomen. Wound received at 4.07 p.m., September 6, 1901, in the Academy of Music, Pan-American Exposition, Buffalo, N.Y. In the line of duty, while receiving the people, was shot by Leon F. Czolgosz.

FIRST DAY – SEPTEMBER 6, FROM 4.07 P.M. TO MIDNIGHT.

Report made to Dr. Roswell Park, medical director, Pan-American Exposition, fixes the time of shooting at 4.07 p.m., and the President's arrival at the emergency hospital 4.18 p.m. Immediately upon being undressed an examination revealed upon the surface of the body two wounds, the one to the right of the sternal line being an abrasion 1 cm. in diameter. Measuring from the suprasternal notch the distance was 5½ cm., from the right nipple 10 cm., and from the line of the right nipple 8¼ cm. The second wound was a penetrating wound of the abdomen 15½ cm. from the left nipple and 16½ cm. from the umbilicus, being 1 cm. from the right of a line drawn from the umbilicus to the nipple, and made by a .32-caliber bullet.

All those present agreed that an immediate laparotomy was demanded, and preparations were made accordingly. Dr. Eugene Wasdin, of the Marine-Hospital Service, administered the anesthetic. The administration of the ether was begun at 5.20 p.m., and the President was under its influence at 5.29 p.m. Dr. M.D. Mann was the operator, Dr. Herman Mynter first assistant, Drs. Parmenter and Lee sponging, Dr. E.C. Mann at sutures, and Drs. Hall and Rixey assisting with the lights.

5.30 p.m. – Dr. Mann made a vertical incision 8 cm. in length, passing through the bullet wound, and in a few minutes enlarged it to 10 cm. A piece of cloth, carried in by the bullet, was found and removed.

5.38 p.m. – 0.002 grams strychnine administered hypodermically.

5.41 p.m. – The stomach was exposed and a perforating bullet wound found in the anterior wall midway between the orifices of the stomach about 1 cm. in diameter and about 1½ cm. from the line of the omental attachment. The wound was examined and enlarged so as to admit the finger.

5.43 p.m. – The wound of the stomach was secured with a double row of silk sutures.

5.55 p.m. – Respiration, 33; pulse, 84; both of good character.

5.58 p.m. – Incision increased to 14½ cm. Abdominal cavity carefully explored and all bleeding points tied off.

6.05 p.m. – Respiration, 36. Intestines examined; omentum ligated and divided, after which perforation in posterior wall of stomach was readily found. It was about 1½ cm. in diameter. The wound was carefully sutured. Pulse, 88, and of good character.

6.20 p.m. – Pulse, 102; only fair in character;

respiration, 39; 1.6 cc of brandy given hypodermically.

6.23 p.m. – Dr. Roswell Park, medical director Pan-American Exposition, arrived in the operating room.

6.31 p.m. – Abdominal cavity irrigated with sterile salt solution and abdominal opening sutured.

6.40 p.m. – Pulse, 120; fair; respiration, 36.

6.48 p.m. – Pulse, 124; tension good; respiration, 36.

6.50 p.m. – Abdominal sutures in place; 7 silkworm gut sutures, with catgut between.

6.51 p.m. – Anesthetic stopped.

7.01 p.m. – Bandaging completed. Pulse, 122; respiration, 32.

7.17 p.m. – Hypodermic of morphine, 0.004 gram administered.

7.32 p.m. – Removed from the hospital to the ambulance, Drs. Park and Wasdin accompanying the President. At this time his condition was good, but he was still under the influence of the anesthetic.

8.20 p.m. – Arrived at the Milburn house and put to bed in fair condition. Pulse, 127; temperature, 100.6; respiration, 30.

8.25 p.m. – Morphine sulphate, gm. 0.016, administered hypodermically.

8.30 p.m. – Pulse improved in character; slight nausea.

The first bulletin issued by the President's physicians, dated at 7 p.m., was as follows:

The President was shot about 4 o'clock; one bullet struck him on the upper portion of the breast bone, glancing and not penetrating; the second bullet penetrated the abdomen 5 inches below the left nipple and 1½ inches to the left of the median line. The abdomen was opened through the line of the bullet wound. It was found that the bullet had penetrated the stomach. The opening in the front wall of the stomach was carefully closed with silk sutures; after which a search was made for a hole in the back wall of the stomach. This was found, and also closed in the same way. The further course of the bullet could not be discovered, although careful search was made. The abdominal wound was closed without drainage. No injury to the intestines or other abdominal organ was discovered.

The patient stood the operation well. Pulse of good quality, rate of 130. Condition at the conclusion of the operation was gratifying. The result can not be foretold. His condition at present justifies hope of recovery.

8.43 p.m. – Pulse, 132. Rested quietly for eight minutes.

9.15 p.m. – Vomited a small amount of partly digested food and a small clot of blood. No fecal odor.

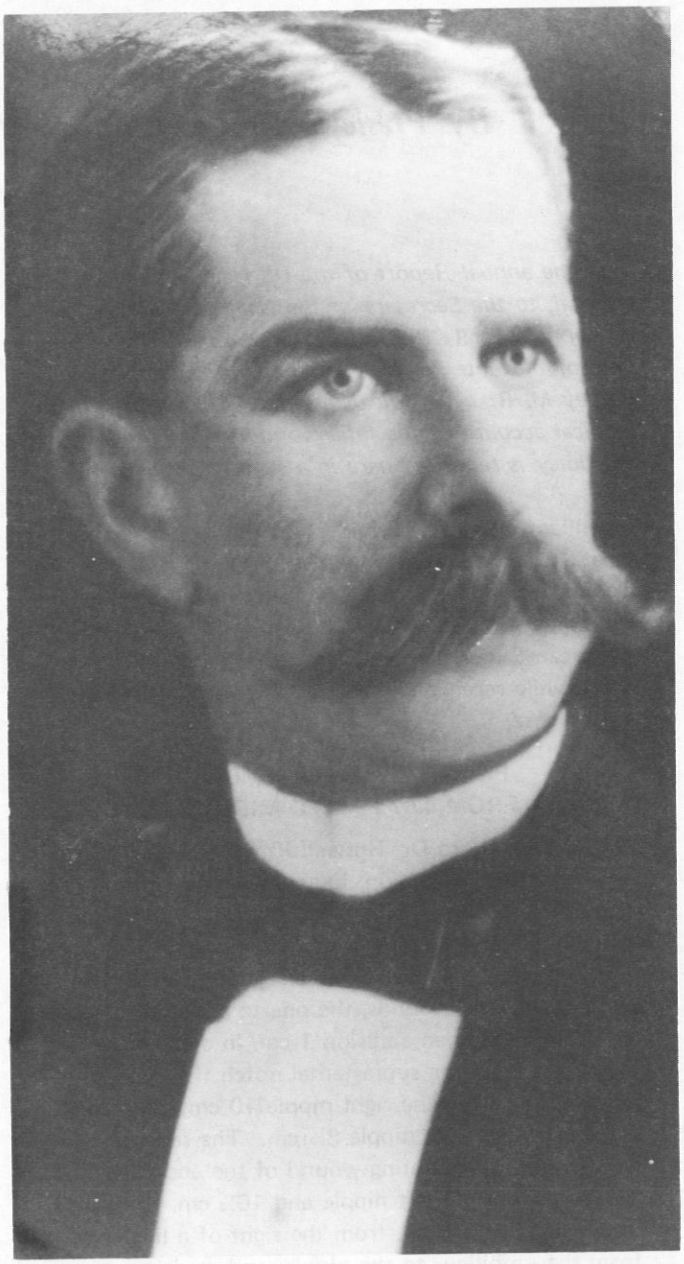
9.40 p.m. – Vomited small amount of undigested food.

10.25 p.m. – Pulse, 128; temperature, 100.4; respiration, 24.

10.40 p.m. – The following bulletin was issued:

The President is rallying satisfactorily, and is resting comfortably. Temperature, 100.4 degrees; pulse, 124; respiration 24.

10.45 p.m. – Slight discoloration of dressings and occasional twinge of pain.



RADM Presley M. Rixey, MC,
USN, Surgeon General 1902 – 1910.

11 p.m. — Pulse, 122; temperature, 101; respiration, 24.

11.10 p.m. — Voided urine, 90 cc.

12 midnight. — Pulse, 128; temperature, 101; respiration, 24. Slept quietly 20 minutes. Saline enema retained.

SECOND DAY — SEPTEMBER 7, 1901.

12.40 a.m. — Passed urine, 60 cc.

1 a.m. — The following bulletin was issued:

The President is free from pain and resting well. Temperature, 100.2; pulse, 120; respiration, 24.

2 a.m. — Pulse, 126. Passed urine, 30 cc.

3 a.m. — Pulse, 110; temperature, 101.6; respiration, 24. The President continued to rest well.

3.20 a.m. — Passed 15 cc urine.

4.10 a.m. — Pulse, 100. Sleeping.

4.55 a.m. — Pulse, 108; temperature, 101.8; respiration, 24. Large amount of gas expelled.

5.05 a.m. — Pulse, 104. Pain severe on deep inspiration.

5.20 a.m. — Saline enema, 1 pint; retained. Restless.

6 a.m. — The following bulletin was issued:

The President has passed a good night. Temperature, 102; pulse, 110; respiration, 24.

6.15 a.m. — Morph. sulph., gm. 0.016, administered hypodermically.

6.50 a.m. — Pulse, 125. Passed urine, 60 cc.

8 a.m. — Pulse, 123; temperature, 102.2; respiration, 24.

9 a.m. — The following bulletin was issued:

The President passed a fairly comfortable night, and no serious symptoms have developed. Pulse, 146; temperature, 102; respiration, 24.

12 noon. — Pulse, 136; temperature, 102.2; respiration, 28. Hypodermic of morph. sulph. gm. 0.01 administered.

1.15 p.m. — Saline enema, 500 cc.

3.30 p.m. — Pulse, 140; temperature, 102.2; respiration, 24.

4.30 p.m. — Pulse, 127. Hypodermic digitalis. Passing much gas by the mouth.

5.30 p.m. — Pulse, 124. Passed urine, 60 cc. Sponged with alcohol. Sleeping. Passed gas by mouth.

6.30 p.m. — Complains of intense pain in pit of stomach. Gave morp., 0.008 gm., hypodermically. No pain, but restless. Sponged with alcohol, and rested quietly for half an hour. The following bulletin was issued:

There is no change for the worse since last bulletin. Pulse, 130; temperature 102.6 degrees; respiration, 29.

7.35 p.m. — Pulse, 133. Saline enema, 500 cc, retained.

7.40 p.m. — Hypodermic digitalis. Passed urine, 45 cc.

8.50 p.m. — Pulse, 132; temperature, 102.5; respiration, 28.

9.30 p.m. — The following bulletin was issued:

Conditions continue much the same. The President responds well to medication. Pulse, 132; temperature, 102.5; respiration, 25. All temperatures reported are taken in the rectum.

10.30 p.m. — Has slept quietly for 15 minutes. Saline enema, 500 cc, with 4 gm. somatose. Rejected 60 cc.

10.40 p.m. — Gave hypodermic digitalis.

10.55 p.m. — Pulse, 140. Very restless. Gave morph., 0.008 gm., hypodermically.

11.15 p.m. — Passed from the bowels 240 cc greenish-colored fluid and two particles of fecal substance. Passed gas by the mouth.

First Urinalysis: 30 cc, dark amber, strongly acid; 0.028 gm. urea/1 cc; trace albumin; neg. sugar; normal phosphates and chlorides; v. small amt. Indican. Microscopic: many large and small epithelial cells, some leucocytes and occ. red cells. Many small hyaline casts, some finely granular.

THIRD DAY — SEPTEMBER 8, 1901.

12.30 a.m. — Pulse, 138; temperature, 102.6; respiration, 28. Restless during sleep. Limbs sponged with alcohol. Voided urine, 60 cc. Quiet, and slept from 2 to 3 o'clock.

3.20 a.m. — The following bulletin was issued:

The President has passed a fairly good night. Pulse, 122; temperature, 102.4 degrees; respiration, 24.

3.30 a.m. — Saline enema, 500 cc. Somatose, 4 gm.

4 to 4.30 a.m. — Confused and very restless.

5 a.m. — Pulse, 120; temperature, 102.2; respiration, 26. Complains of feeling chilly, but it passed in a moment.

5.35 a.m. — Voided urine, 45 cc. Restless and talkative from 5 to 6 o'clock.

5.50 a.m. — Expelled a small quantity of brown fluid and gas by rectum.

6 a.m. — Expelled small quantity of brown fluid. Gas by mouth. Sleeping.

6.55 a.m. — Hypodermic digitalis. Passed gas by mouth.

7.45 a.m. — Pulse, 132; temperature, 102.8; respiration, 24. Hypodermic of strychnine, 0.001 gm.

8.20 a.m. — Wound dressed. Urine voided, 90 cc.

9 a.m. — The following bulletin was issued:

The President passed a good night and his condition this morning is quite encouraging. His mind is clear and he is resting well. Wound dressed at 8.30 and found in a very satisfactory condition. There is no indication of peritonitis.

Pulse, 132; temperature, 102.8; respiration, 24.

9.30 a.m. — Sleeping.

10.15 a.m. — Pulse, 132. Hypodermic digitalis.

10.25 a.m. — High enema; epsom salts, glycerine, and water.

10.40 a.m. — Small dark-brown fluid stool with gas.

11 a.m. — Voided urine, 90 cc.

12 noon. — The following bulletin was issued:

The improvement in the President's condition has continued since last bulletin. Pulse, 128; temperature, 101; respiration, 27.

Hypodermic strychnine. Small dark-brown fluid stool.

12.30 p.m. — Saline enema with somatose; not retained. Alcohol rub. Sleeping. Dr. Charles McBurney, of New York, joined the surgeons.

3 p.m. — Voided urine, 90 cc. Pulse, 130; temperature, 101; respiration, 30.

4 p.m. — The following bulletin was issued:

The President, since the last bulletin, has slept quietly — four hours altogether — since 9 o'clock. His condition is satisfactory to all the physicians present. Pulse, 128; temperature, 101; respiration, 28.

Hypodermic strychnine. Sleeping.

4.45 p.m. — Restless and talkative. Water, 4 cc, by mouth; first taken by mouth.

4.55 p.m. — Water, 4 cc, by mouth. Enema of sweet oil, soap, and water. Passed some gas and 270 cc slightly colored fluid with a few particles of fecal substance and a very little mucus.

5.10 p.m. — Water, 4 cc. Sponged with alcohol. Mouth washed with peroxide solution.

5.35 p.m. — Water, 8 cc. Gas passed by mouth.

5.50 p.m. — Gas and water discharged by rectum.

6.10 p.m. — Water, 8 cc.

6.20 p.m. — Water, 8 cc. Nutritive enema of egg, whisky, and water; partly rejected.

7.15 p.m. — Hypodermic digitalis.

7.30 p.m. — Hypodermic strychnine.

7.40 p.m. — Pulse, 130; temperature 101.6; respiration, 28.

8 p.m. — Water discharged from the bowels. Very restless.

8.20 p.m. — Passed a great deal of gas and some fluid with particles of fecal substance.

9 p.m. — The following bulletin was issued:

The President is resting comfortably and there is no special change since last bulletin. Pulse, 130; temperature, 101.6; respiration, 30.

Restless. Voided urine, 45 cc.

9.45 p.m. — Gas by rectum. Quiet only a few minutes at a time.

10 p.m. — Pulse, 128; respiration, 28.

Second Urinalysis: 450 cc, amber — slightly turbid; strongly acid; 1.026; 0.038 gm. urea/1 cc; trace albumin; sugar neg.; abundant Indican; increased sulphates, phosphates and chlorides. Microscopic: Abundant casts, small, finely granular. Diminished small renal epithelial cells; uric acid crystals.

FOURTH DAY — SEPTEMBER 9, 1901.

12.01 a.m. — Pulse, 124; temperature, 101.4; respiration, 28. Gas by mouth. Sleeping.

1.25 a.m. — Water, 8 cc. Restless from 1 to 1.30 o'clock.

2 a.m. — Quiet and sleeping. Gas by mouth and by rectum.

2.20 a.m. — Took water, 12 cc. Voided urine, 120 cc.

3.15 a.m. — Very restless and mind much disturbed. Codeia phos. 0.015 gm. hypodermically.

3.20 a.m. — Nutritive enema. Sponged legs and arms with alcohol.

4.10 a.m. — Quiet and resting. Pulse, 120; temperature, 101; respiration, 28.

5.15 a.m. — Water, 12 cc. Expelled small quantity of fluid, faecal odor, with particles of faecal substances and gas.

6 a.m. — The following bulletin was issued:

The President passed a somewhat restless night, sleeping fairly well. General condition unchanged. Pulse, 120; temperature, 101 degrees; respiration, 28.

Slept at intervals from 5 to 6 o'clock. Water, 12 cc.

7.09 a.m. — Water, 15 cc. Gas by rectum. Voided urine, 150 cc. Mind clear. Feels chilly. Water, 24 cc.

8 a.m. — Water, 24 cc.

9 a.m. — Pulse, 112; temperature, 100.8; respiration, 28. Restless from 8 to 9 o'clock. Passing gas by mouth and rectum.

9.20 a.m. — The following bulletin was issued:

The President's condition is becoming more and more satisfactory. Untoward incidents are less likely to occur. Pulse, 112; temperature, 100.8 degrees; respiration, 28.

The following memorandum was issued to the nurses:

Nurses' hours.

Miss Mohun . . . . . 8 a.m. to 4 p.m.
Miss Connolly. . . . . 4 p.m. to midnight.
Miss McKenzie . . . . . 12 midnight to 8 a.m.

The nurse going off duty must not leave the sick quarters until she has satisfied her relief that all dressings are prepared and the relief understands the instructions of the physicians. The instructions will be in writing. Nurses on tour duty must not leave the sick room without proper relief (some one of the staff at the bedside of the patient), and then only for five minutes, unless relieved by a trained nurse.

Miss Hunt will be in the house and will be the relief for

meals and also the special nursing of Mrs. McKinley.

Dr. Rixey will write out the instructions of the physicians and be accessible at all times. Any change demanded must be reported to him at once.

9.35 a.m. — Water, 30 cc.

10 a.m. — Calomel, 0.015 gm., dry on the tongue. Nutritive enema of egg, whisky, and water.

11 a.m. — High enema, olive oil and castor oil.

11.15 a.m. — Calomel, 0.015 gm., dry on the tongue. Water, 30 cc. More quiet.

12 noon. — High enema, 2,000 cc soap and water with 8 cc oxgall. This was followed by a large, light brown, partly formed stool with gas.

12.15 p.m. — Calomel, 0.015 gm. Water, 60 cc. Voided 240 cc urine. Sleeping.

1.15 p.m. — Calomel, 0.015 gm., dry on the tongue. Alcohol rub. Sleeping.

2.15 p.m. — Calomel, 0.015 gm. Water, 24 cc. Sleeping.

3 p.m. — The following bulletin was issued:

The President's condition steadily improves and he is comfortable, without pain or unfavorable symptoms. Bowel and kidney functions normally performed. Pulse, 113; temperature, 101; respiration, 26.

Wound dressed.

3.20 p.m. — Calomel, 0.015 gm. Dry on the tongue.

4.20 p.m. — Spit up 15 cc greenish bitter fluid.

4.30 p.m. — Voided urine, 120 cc. Nutritive enema given; part rejected.

5.50 p.m. — Hot water, 16 cc.

6.15 p.m. — Pulse, 112. Considerable gas by mouth, and feels nauseated.

7.10 p.m. — Hot water, 16 cc. Slept 15 and 20 minutes.

8 p.m. — Slept 20 minutes. Pulse, 112; temperature, 101; respiration, 27.

9.30 p.m. — The following bulletin was issued:

The President's condition continues favorable. Pulse, 112; temperature, 101; respiration, 27.

Voided urine, 180 cc. Gave codeia, 0.015 gm.

10 p.m. — Nutritive enema. Complains of feeling full and very uncomfortable.

11.30 p.m. — Hot water, 16 cc.

Third Urinalysis: 540 cc, amber — slightly turbid, 1.026; trace albumin; less Indican; 0.047 gm. urea/1 cc; sugar neg. Microscopic: Fewer casts, small granular and large hyaline types, few renal epithelial cells, many cylindroids and increased amorphous urates.

FIFTH DAY — SEPTEMBER 10, 1901.

12.05 a.m. — High enema of soap and water. Expelled part of the enema with light-brown stained fluid with dissolved fecal substances. Slept quietly for 25 minutes.

1.46 a.m. — Uncomfortable; turning frequently.

1.50 a.m. — Very quiet and slept 35 minutes.

2.30 a.m. — Pulse, 108; temperature, 100.4; respiration, 26. Voided urine, 180 cc. Gave hot water, 24 cc.

3 to 4 a.m. — Sleeping. Hot water, 30 cc.

4.10 to 5.05 a.m. — Sleeping.

5.20 a.m. — The following bulletin was issued:

The President has passed the most comfortable night since the attempt on his life. Pulse, 118; temperature, 100.4; respiration, 28.

Has passed much gas by mouth and rectum.

6 a.m. — Wakened and feels very comfortable. Water, 60 cc.

7.05 a.m. — Nutritive enema. Alcohol rub. All previous temperatures by rectum; all following by mouth unless otherwise noted.

8.40 a.m. — Pulse, 109; temperature, 99.8; respiration, 25.

9 a.m. — The following bulletin was issued.

The President's condition this morning is eminently satisfactory to his physicians. If no complications arise a rapid convalescence may be expected. Pulse, 104; temperature, 99.8; respiration, 26. The temperature is taken by mouth and should be read about 1 degree higher by rectum.

9.20 a.m. — Water, 60 cc. Voided urine, 60 cc. Sleeping.

10.45 a.m. — Nutritive enema; expelled a portion.

11.40 a.m. — Pulse, 112; temperature, 100.3; respiration, 26. Water, 60 cc. Complains of some distress in abdomen.

12 noon. — Expelled a quantity of light yellow fluid, fecal odor.

12.30 p.m. — Hypodermic codeia phos., 0.015 gm. Resting more quietly; sleeping. Voided urine, 150 cc.

2 p.m. — Lime juice for the mouth. Water, 30 cc. Oozing visible on bandage.

2.45 p.m. — Pulse, 120; temperature, 100; respiration, 28. Gas by mouth.

3.20 p.m. — The following bulletin was issued:

There is no change since this morning's favorable bulletin. Pulse, 110; temperature, 100; respiration, 28.

3.35 p.m. — Wound dressed. Water, 24 cc. Voided urine, 150 cc. Sleeping.

4.15 p.m. — Resting. Alcohol rub. Sleeping. Water, 90 cc.

6.10 p.m. — Nutritive enema. Slept half an hour and expelled 180 cc light yellow fluid, fecal odor, with gas.

9.20 p.m. — Pulse, 114; temperature, 100.6; respiration, 28. Some of the stitches removed from the

abdominal wound and dressing done by Dr. Mann. Much exhausted, tired and very restless.

10.30 p.m. – The following bulletin was issued:

The condition of the President is unchanged in all important particulars. His temperature is 100.6; pulse, 114; respiration, 28.

When the operation was done on Friday last it was noted that the bullet had carried with it a short distance beneath the skin a fragment of the President's coat. This foreign material was of course removed, but a slight irritation of the tissues was produced, the evidence of which has appeared only tonight. It has been necessary on account of this slight disturbance to remove a few stitches and partially open the skin wound. This incident can not give rise to other complications, but it is communicated to the public as the surgeons in attendance wish to make their bulletins entirely frank. In consequence of this separation of the edges of the surface wound, healing of the same will be somewhat delayed. The President is now well enough to begin to take nourishment by the mouth in the form of pure beef juice.

SIXTH DAY – SEPTEMBER 11, 1901.

12.05 a.m. – Beef juice, 4 cc. First food taken into the stomach since the operation. Tasted good.

1.15 a.m. – Beef juice, 4 cc. Water, 90 cc. Urine voided, 240 cc.

2 a.m. – Starch and laudanum enema followed by nutritive enema. Alcohol rub.

3 a.m. – Wound dressed by Dr. Rixey. Expelled from rectum 90 cc light yellow fluid, fecal odor.

4.50 a.m. – Has slept about 40 minutes. Beef juice, 4 cc. Water, 90 cc.

5.15 a.m. – Gas by rectum. Feels chilly. Voided urine, 150 cc.

6 a.m. – The following bulletin was issued:

The President has passed a very comfortable night. Pulse, 120; temperature, 100.2; respiration, 26.

Beef juice, 6 cc. Sleeping.

7 a.m. – Beef juice, 8 cc, taken with a relish.

8 a.m. – Beef juice, 8 cc. Resting comfortably since 12 o'clock. Sleeping more than usual.

8.30 a.m. – Pulse, 116; temperature, 100.2; respiration, 28. Voided urine, 180 cc. Took beef juice, 12 cc.

9 a.m. – The following bulletin was issued:

The President rested comfortably during the night. Decided benefit has followed the dressing of the wound made last night. His stomach tolerates the beef juice well, and it is taken with great satisfaction. His condition this morning is excellent. Pulse, 116; temperature, 100.2.

10.10 a.m. – Wound dressed. Remaining stitches removed. Starch enema followed by nutritive enema. Beef juice by mouth, 12 cc.

11 a.m. – Water, 120 cc. Expelled small amount light yellow fluid, fecal odor. Sleeping.

12 noon. – Sleeping.

12.40 p.m. – Beef juice, 16 cc. High enema soap and water.

12.50 p.m. – Hypodermic strychnine. Restless.

1.15 p.m. – Albumin water, 16 cc. Alcohol rub. Slept quietly for 1 hour.

2.15 p.m. – Pulse, 120; temperature, 100.2; respiration, 26. Complains of headache.

2.30 p.m. – Beef juice, 16 cc. Voided urine, 240 cc.

3 p.m. – Camphor applied to head. Albumin water, 16 cc.

3.30 p.m. – Wound dressed by Dr. McBurney. The following bulletin was issued:

The President continues to gain and the wound is becoming more healthy. The nourishment taken into the stomach is being gradually increased. Pulse, 120; temperature, 100.2.

4 p.m. – Beef juice, 16 cc.

4.50 p.m. – Water, 180 cc. Voided urine, 120 cc.

5 p.m. – Starch and laudanum enema.

5.20 p.m. – Nutritive enema of egg, whisky, and water. Sleeping.

6.15 p.m. – Albumin water, 16 cc.

7.30 p.m. – Slept three-quarters of an hour. Complains of bandage being too tight.

7.35 p.m. – Beef juice, 16 cc. Pulse, 120; temperature, 100.4; respiration, 30.

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8 p.m. – Lower strap loosened by Dr. Rixey. Sleeping.

8.45 p.m. – Albumin water, 16 cc. Rubbed with alcohol. Complains of bandage being uncomfortably tight and it is loosened by Dr. Rixey. Blood count by Dr. Wasdin shows absence of blood poisoning.

9.40 p.m. – Beef juice, 16 cc. Wound dressed by Dr. McBurney.

10 p.m. – The following bulletin was issued:

The President's condition continues favorable. Blood count corroborates clinical evidence of absence of blood poisoning. He is able to take more nourishment and relishes it. Pulse, 120; temperature, 100.4.

10.40 p.m. – Beef juice, 16 cc. Changed to fresh bed.

11 p.m. – Starch and laudanum enema.

11.20 p.m. – Nutritive enema of whisky, egg, and water.

11.40 p.m. – Beef juice, 30 cc. Strychnine hypodermically, 0.002 gm. Pulse, 126; temperature, 100.4; respiration, 32. Sleeping.

12 midnight. – Beef juice, 30 cc. Voided urine, 240 cc.

Fourth Urinalysis: 82 cc, amber — clear, 1.027; strongly acid; trace albumin; 0.04 gm. urea/1 cc; abundant Indican. Microscopic: Increased uric-acid crystals; very few renal epithelial cells; fewer casts, small and large hyaline — some finely granular.

SEVENTH DAY, SEPTEMBER 12, 1901.

1 a.m. — Beef juice, 30 cc. Very restless. Alcohol rub.

1.45 a.m. — Has been sleeping. Water, 90 cc. Complains of pain in the abdomen.

2 a.m. — Beef juice, 30 cc. Whisky, 8 cc. Water, 60 cc.

3.10 a.m. — Chicken broth, 60 cc. Water, 120 cc.

4 a.m. — Beef juice, 30 cc. Sleeping.

4.35 a.m. — Water, 16 cc.

5 a.m. — Pulse, 122; whisky and water; chicken broth. Voided urine, 270 cc.

6 a.m. — Beef juice, 30 cc. Upper part of body quite moist from 5.30 to 6 o'clock. Sleeping.

6.20 a.m. — The following bulletin was issued:

The President has had a comfortable night. Pulse, 122; temperature, 100.2.

7 a.m. — Whisky and water. Sleeping.

7.35 a.m. — Hypodermic strychnine.

8 a.m. — Voided urine, 150 cc. Whisky and water. Comfortable night; sleeping more than usual.

8.30 a.m. — Chicken broth, piece of toast, and small cup of coffee.

9.15 a.m. — Wound dressed and doing well. Washed with iodine solution and peroxide.

9.20 a.m. — Castor oil, 30 cc.

9.30 a.m. — The following bulletin was issued:

The President has spent a quiet and restful night and has taken much nourishment. He feels better this morning than at any time. He has taken a little solid food and relished it. Pulse, 120; temperature, 100.2 degrees.

10 a.m. — Pulse, 122; temperature, 100.2; respiration, 29. Whisky and water.

10.30 a.m. — Beef juice, 45 cc. Slept at intervals. Bathed head and hands with camphor. Passing much gas by rectum and mouth.

11.30 a.m. — Pulse, 124. Infusion of digitalis, 8 cc. Restless and depressed. Alcohol rub and sponge.

12.05 p.m. — Hypodermic strychnine, 0.002 gm.

Dr. McBurney returned home.

12.30 p.m. — Whisky and water. Chicken broth. Sleeping.

1.15 p.m. — Voided urine, 240 cc.

1.30 p.m. — Small piece of toast and one soft-boiled egg. Did not relish it, and ate very little. Quieter and more cheerful since having last strychnine.

2 p.m. — Pulse, 128; temperature, 100.2; respiration, 28. Water, 90 cc. Infusion of digitalis, 8 cc. Skin moist and cold.

2.30 p.m. — Complains of headache and nausea. Whisky and water. Beef juice, 45 cc. Drowsy; feels very tired.

3.05 p.m. — Pulse, 134; temperature, rectum, 101; respiration, 32. Hypodermic strychnine, 0.003 gm. Dr. Stockton called in consultation.

3 p.m. — The following bulletin was issued:

The President's condition is very much the same as this morning. His only complaint is of fatigue. He continues to take a sufficient amount of food. Pulse, 126; temperature, 100.2.

3.30 p.m. — Infusion digitalis, 15 cc. Hypodermic codeia phos. 0.015 gm. Water, 150 cc. Whisky and water. Beef juice, 30 cc. Resting and sleeping at intervals.

4.45 p.m. — Pulse, 128; respiration, 28. Mind wandering and restless.

5 p.m. — Infusion digitalis, 15 cc. Chicken broth, 90 cc. Skin moist and cold.

6 p.m. — Pulse, 130; respiration, 31. Sleeps at intervals. Complains of feeling very tired and headache.

6.30 p.m. — Voided urine, 210 cc. Whisky and water. Sleeping.

7 p.m. — Hypodermic strychnine, 0.003 gm. Calomel, 0.18 gm. dry on tongue.

7.30 p.m. — Whisky and water. Quiet and sleeping at intervals.

8 p.m. — Pulse, 130; temperature, rectum, 101; respiration, 28. Wound dressed by Dr. Mann.

8.30 p.m. — Resting very quietly. Upper part of body quite moist; cold. The following bulletin was issued:

The President's condition this evening is not quite so favorable. His food has not agreed with him and has been stopped. Excretion has not yet been properly established. The kidneys are acting well. His pulse is not satisfactory but has improved in the last two hours. The wound is doing well. He is resting quietly. Temperature, 100.2; pulse, 128.

9.30 p.m. — Castor oil, 30 cc.

9.35 p.m. — High enema, soap and water and oxgall. Water, 120 cc. A large, dark, semifluid stool. Urine voided, 180 cc.

10 p.m. — Whisky and water. Hypodermic strychnine, 0.002 gm.

10.30 p.m. — Seems much exhausted after the enema. Whole body moist and cold. Pulse weak and thready. Slept quietly 20 minutes.

11 p.m. — Whisky and water. Normal salt solution, 420 cc, subcutaneously.

12 midnight. — Whisky and water. Infusion digitalis.

Oxygen inhaled. The following bulletin was issued:

All unfavorable symptoms in the President's condition have improved since the last bulletin. Pulse, 120; temperature, 100.2.

Fifth Urinalysis: 132 cc, light amber — turbid, 1.025 acid; trace albumin; 0.044 gm. urea/1 cc. Microscopic: renal casts as before and amorphous phosphates.

EIGHTH DAY — SEPTEMBER 13, 1901.

12.20 a.m. — Voided urine, 240 cc. Restless and complains of headache. Pulse fairly good.

1 a.m. — Pulse, 132. Whisky and water. Perspiring; body warmer. Very restless and wants to get up; tired.

1.45 a.m. — Hypodermic strychnine, 0.002 gm.

2 a.m. — Whisky and water, camphorated oil hypodermically.

2.15 a.m. — Clam broth, 45 cc.

2.45 a.m. — Hypodermic camphorated oil.

2.50 a.m. — The following bulletin was issued:

The President's condition is very serious, and gives rise to the gravest apprehension. His bowels have moved well, but his heart does not respond properly to stimulation. He is conscious. The skin is warm and the pulse small, regular, easily compressible, and 126; respiration, 30; temperature, 100.

3 a.m. — Hypodermic of camphorated oil. Whisky and water. Clam broth.

3.30 a.m. — Quiet. Pulse, 124, volume fair; respiration, 32. Water, 16 cc. Hypodermic camphorated oil. Condition of skin better. Sleeping.

4 a.m. — Whisky and water. Essential oil of camphor hypodermically.

4.30 a.m. — Chicken broth, 60 cc.

5 a.m. — Whisky and water.

5.20 a.m. — Pulse, 122, volume not good. Infusion digitalis, 15 cc. Whisky and water. Mind clear. Sleeps for 5 to 10 minutes at a time.

5.55 a.m. — Hypodermic strychnine, 0.003 gm. Skin slightly better.

6.30 a.m. — Liquid peptonoids; whisky and water.

7 a.m. — Coffee, 45 cc. Clam broth, 60 cc.

7.40 a.m. — Pulse, 128; temperature, 100.8; respiration, 32.

8 a.m. — Whisky and water. Passed urine, 270 cc.

8.30 a.m. — Hypodermic of adrenalin. Chicken broth.

9 a.m. — Wound dressed with balsam of Peru. Whisky and water. Liquid peptonoid, 15 cc. The following bulletin was issued:

The President's condition has somewhat improved during the past few hours. There is a better response to stimulation. He is conscious and free from pain. Pulse, 128; temperature, 99.8.

Sixth Urinalysis: 252 cc, amber — turbid, acid, 1.023; 0-trace albumin; 0.047 gm. urea/1 cc; trace Indican. Microscopic: no change from yesterday's sample.

9.40 a.m. — Hypodermic of strychnine, 0.002 gm. Hypodermic adrenalin, 1.4 cc.

10 a.m. — Salt solution subcutaneously. Whisky and water.

10.20 a.m. — Clam broth, 60 cc; refused one-half.

11 a.m. — Whisky and water.

12 noon. — Whisky and water. Sleeping at intervals; slept 15 minutes.

12.30 p.m. — Chicken broth, 60 cc; took only half of it. The following bulletin was issued:

The President's physicians report that his condition is practically unchanged since the 9 o'clock bulletin. He is sleeping quietly.

1 p.m. — Whisky and water. Called for bedpan, but bowels did not move. Quiet and sleeping.

1.45 p.m. — Pulse, 123, not good; temperature, 100.4; respiration, 26. Liquid peptonoids, 15 cc. A little difficulty for the first time in swallowing. Hypodermic strychnine, 0.002 gm. Hypodermic brandy, 2 cc.

2 p.m. — Whisky and water.

2.15 p.m. — Clam broth, 30 cc; refused more. Wound dressed and doing well.

2.30 p.m. — Voided urine, 240 cc. The following bulletin was issued:

The President has more than held his own since morning, and his condition justifies the expectation of further improvement. Pulse, 123; temperature, 99.4.

Hypodermic of brandy, whisky, and water. Liquid peptonoids.

3.30 p.m. — Hypodermic brandy. Pulse very weak. Hypodermic camphorated oil.

4 p.m. — Whisky and water. The following bulletin was issued:

The President's physicians report that he is only slightly improved since the last bulletin. The pulse and temperature remain the same as at that hour.

4.30 p.m. — Hypodermic of brandy. Chicken broth, 60 cc.

4.36 p.m. — Hypodermic essential oil camphorated.

4.40 p.m. — Hypodermic strychnine, 0.002 gm.

4.55 p.m. — Adrenalin hypodermically. Brandy and water.

5 p.m. — Oxygen. Urinated involuntarily.

5.15 p.m. — The following bulletin was issued:

The President's physicians report that his condition is grave at this hour. He is suffering from extreme prostration. Oxygen is being given. He responds to stimulation but poorly. Pulse, 125; respiration, 40.

6 p.m. — Oxygen continued. Normal salt solution

subcutaneously. Whisky and water. Hypodermic nitroglycerin; hypodermic brandy.

6.15 p.m. — The following bulletin was issued:

The President's physicians report that his condition is most serious in spite of vigorous stimulation. The depression continues and is profound. Unless it can be relieved the end is only a question of time.

6.25 p.m. — No response to stimulants. Very restless. Hypodermic morphia, 0.015 gm., and atropine, 0.00045 gm.

7.40 p.m. — Oxygen continued; almost pulseless. Morphia hypodermically, 0.015 gm.

9 p.m. — Heart sounds very feeble. Oxygen continued. Slight reflex movements, and at 2.15 a.m., September 14, 1901, the President died.

Notes On The Autopsy On President McKinley, September 14, 1901.

Ordinary signs of death; ecchimosis in dependent portions of the body. Rigor mortis well marked. Upon the surface of the chest to the right of the midsternal line a spot 1 cm. in diameter, dark red in color, with a slight scab formation covering it: measuring from the supersternal notch the distance is 5½ cm.; from the right nipple, 10 cm.; from the line of the right nipple, 8¼ cm. Surrounding this spot, at which point there is an evident disolution of the continuity of the skin, is a discolored area of oval shape extending upward and to the right. In its greatest length it is 11 cm., and in its greatest width, 6 cm. It extends upward in the direction of the right shoulder. The skin within this area is discolored; greenish yellow and mottled. The surface of the abdomen is covered with a surgical dressing which extends down to the umbilicus and upward to just below the nipples. The innermost layer of cotton is covered or stained with balsam of Peru and blood. On removing this dressing a wound is exposed. Inserted in the wound are two layers of gauze, likewise impregnated with balsam of Peru. The wound has been packed with gauze saturated with the same substance. The wound is 14½ cm. in length and is open down to the abdominal muscles. The layer of abdominal fat is 3¾ cm. in thickness. The appearance of the fat is good, a bright yellow in color. No evidence of necrosis or sloughing. In the left margin of the surgical wound, lying 1 cm. to the right of a line drawn from the umbilicus to the left nipple, 15½ cm. from the nipple and 16½ cm. from the umbilicus, is a partly healed indentation of the skin, and an excavation of the fat immediately beneath it. This extends down to the peritoneal surface. The base of the surgical wound is formed by folds of omentum. On making the median incision, starting from the supersternal notch and extending to a point just below the symphysis, the subcutaneous fat is exposed, which is of bright yellow color and normal appearance, except in an area which corresponds superficially to the area of discoloration described as surrounding the wound upon the chest wall. In this area the fat is of a red color, the connective tissue structure is infiltrated with dark red pigment. The subcutaneous fat is firm and measures 4¾ cm. in thickness. On opening the sheath of the right rectus muscle it is seen to be of dark red color. (Culture taken from ecchimotic tissue under the upper bullet hole and from between the folds of the small intestine.) (Three tubes from each locality on agar and gelatine.)

On opening the abdominal cavity the parietal surface of the peritoneum is exposed and is found to be covered with a slight amount of bloody fluid; is perfectly smooth and not injected. The great omentum extends downward to a point midway between the umbilicus and the symphysis. It is thick, firm; its inferior border is discolored by coming in contact with the intestines. Below the umbilicus a few folds of intestines are exposed. These are likewise covered with discolored blood, after the removal of which the peritoneal surface is found to be shiny. On the inner aspect of the abdominal wound the omentum is found to be slightly adherent to the parietal peritoneum, and can be readily separated with the hand from the edge of the wound. (Culture taken at this point, the surface of the wound.) At this point the omentum is somewhat injected. This adhesion to the omentum is found to extend entirely around the abdominal wound. The peritoneum immediately adjacent to the inner aspect of the abdominal wound is ecchymotic. In the omentum immediately beneath the abdominal wound is an incision, 5 cm. from the medial line and extending downward from the margin of the ribs 8 cm. On removing the subcutaneous fat and muscles from the thoracic wall, the point which marks the dissolution continuity of the skin upon the surface is found to lie directly over the margin of the sternum and to the right side between the second and third ribs. There is no evidence of ecchymosis or injury to the tissues or muscles beneath the subcutaneous fat. On making an incision through the subcutaneous fat directly through the wound upon the surface a small cavity is exposed about the size of a pea just beneath the skin, which is filled with fluid blood. (A section of tissue, including the lower half of the wound and extending through the subcutaneous fat, is taken for examination. The upper portion of the wound is removed for chemical examination.) The subcutaneous tissue underlying the area of discoloration on the surface of the chest wall shows hemorrhagic infiltration.

On removing the sternum the lungs do not extend far forward. A large amount of pericardial fat is exposed. Pleural surface on both sides is smooth. There are no adhesions on either side within the pleural cavities. The diaphragm on the right side extends upward to a point opposite the third rib in the mammary line. No perceptible amount of fluid in either pleural cavity. On opening the pericardial cavity the surface of the pericardium is found to be smooth and pale. The pericardium contains approximately 6 cc of straw-colored,

slightly turbid fluid. (Some taken for examination.)

On exposing the heart it is found covered with a well-developed paniculus. The heart measures from the base to the apex on the superficial aspect 10½ cm. The right ventricle is apparently empty. The heart feels soft and flaccid. On opening the left ventricle a small amount of dark red blood is found. The muscle of the left ventricular wall is 1½ cm. in thickness; dark reddish brown in color; presents a shiny surface. The average thickness of the pericardial fat is 3½ mm. (Blood taken from the auricle for examination.) The left auricle contains but a small amount of dark, currant-colored blood. The mitral valve admits three fingers. The right ventricle, when incised in the anterior line, is found to be extremely soft; the muscular structure is 2 mm. in thickness. The paniculus measures 7 mm. The muscle is dark red in color; very shiny.

On opening the right auricle it is found to be filled and distended by a large currant-colored clot which extends into the vessels. The tricuspid orifice admits readily three fingers. The coronary arteries were patulous and soft; no evidence of thickening.

On unfolding the folds of intestine there is no evidence of adhesion until a point just beneath the meso-colon is reached, when, on removing a fold of small intestine a few spoonfuls of greenish gray thick fluid flows into the peritoneal cavity. On the anterior gastric wall is an area to which a fold of the omentum is lightly adherent. On breaking the adhesion there is found a wound about midway between the gastric orifices, 3½ cm. in length, parallel with the greater curvature of the stomach, 1½ cm. from the line of omental attachment. This wound is held intact by silk sutures. The cardiac end of the stomach is free. There is no evidence of adhesion at any other point on the anterior wall. The gastric wall surrounding the wound just mentioned, for a distance of 2 or 3 cm., is discolored, dark greenish gray in appearance, and easily torn. On exposing the posterior wall of the stomach from above along the greater curvature of the stomach the omentum is found to be slightly adherent, a line of silk ligatures along the greater curvature of the stomach marking the site where the omentum had been removed. On throwing the omentum downward the posterior gastric wall is exposed. On the posterior wall of the stomach, a distance of 2 cm. from the line of omental attachment, is a wound approximately 2 cm. in length, held intact by silk sutures. The gastric wall surrounding this wound is discolored. On the surface of the meso-colon, which is posterior to the gastric wall at this point, is a corresponding area of discoloration, the portion coming directly in contact with the wound in the gastric wall being of dull gray color. The remainder of the surface of the posterior wall of the stomach is smooth and shiny. Beyond the surgical wound in the posterior wall of the stomach is found an opening in the retro-peritoneal fat large enough to admit two fingers. This opening communicates with a tract which extends downward and backward as far as the finger can reach. The tissues surrounding this tract are necrotic. On removing the descending portion of the colon a large irregular cavity is exposed, the walls of which are covered with gray, slimy material, and in which are found fragments of necrotic tissues. Just at the superior margin of the kidney is located a definite opening which forms the bottom of the tract traced from the stomach. On stripping the left kidney from its capsule, it is found that the superior portion of the capsule is continuous with the cavity. The weight of the left kidney is 5 oz. 1 gr. The kidney is readily stripped from its capsule; is dark red; the stellate veins are prominent; and along its greater curvature are numerous dark red depressions. On the superior aspect of the kidney is a protrusion of the cortex, dark-red in color, and in this protrusion is a laceration 2 cm. in length, extending across the superior border approximately at right angles to the periphery of the kidney and from before backward. On incising the kidney, the cortex and medulla are not easily distinguishable from one another; both are of rose-red color, the cortex measuring approximately 6 mm. in thickness. The vessels in the pyramids of Farriem are very prominent. Beneath the protruding portion of the surface the cortex is dark red in color. The discoloration extends downward in pyramidal form into the medulla. The laceration of the surface marks the apex of the protrusion of the kidney substance. Between the spleen and the superior aspect of the kidney is a necrotic tract which extends down and backward and ends in a blind pocket. The tract, which includes the superior aspect of the kidney, can be traced into the perinephritic fat to a point just above the surface of the muscles of the back. The necrotic cavity, which connects the wound on the posterior wall of the stomach and the opening adjacent to the kidney capsule, is walled off by the meso-colon and is found to involve a considerable area of the pancreas. A careful examination of the tract leading down toward the dorsal muscles fails to reveal the presence of any foreign body. After passing into the fat the direct character of the tract ceases and its direction can be traced no farther. The adjoining fat and the muscles of the back were carefully palpated and incised without disclosing a wound or the presence of a foreign body. The diaphragm was carefully dissected away and the posterior portion of the thoracic wall likewise carefully examined. All fat and organs which were removed, including the intestines, were likewise examined and palpated without result.

The great amount of fat in the abdominal cavity and surrounding the kidney rendered the search extremely difficult.

The liver is dark red in appearance, the gall bladder distended. The organ was not removed.

The right kidney is embedded in a dense mass of fat; capsule strips freely; it weighs 5 ounces; measures 11½ cm.; substance is soft; cortex is 6 mm. in thickness. There are a few depressions of the surface, and the stellate veins are prominent.

The pancreas at its center forms part of the necrotic cavity. Through its body are found numerous minute hemorrhages and areas of gray softening, the size of a pea and smaller. These are less frequent in the head portion of the pancreas.

The cause of death having been established and the autopsy having lasted nearly four hours, it was discontinued, as a further search for the bullet could serve no useful purpose.

There is no evidence of organic disease in any organ examined.

A copy of Dr. Gaylord's report, received by me on October 16, gives the following anatomical diagnosis:

In summing up the macroscopic and microscopic findings of the autopsy, the following may be stated: The original injuries to the stomach wall had been repaired by suture, and this repair seems to have been effective. The stitches were in place and the openings in the stomach wall effectually closed. Firm adhesions were formed both upon the anterior and posterior walls of the stomach, which reenforced these sutures. The necroses surrounding the wounds in the stomach do not seem to be the result of any well-defined cause. It is highly probable that they were practically terminal in their nature and that the condition developed as a result of lowered vitality. In this connection there is no evidence to indicate that the removal of the omentum from the greater curvature and the close proximity of both of these wounds to this point had any effect in bringing about the necrosis of the gastric wall, although circulatory disturbances may have been a factor. The fact that the necrotic tissue had not been affected by digestion strongly indicates that the necrosis was developed but shortly before death. The excavation in the fat behind the stomach must be largely attributed to the action of the missile. This may have been the result of unusual rotation of a nearly spent ball or the result of simple concussion from the ball passing into a mass of soft tissues. Such effects are not unknown. The fact that the ball grazed the superior aspect of the left kidney, as shown by the macroscopic investigation of that organ, indicates the direction of the missile, which passed in a line from the inferior border of the stomach to the tract in the fat immediately superior to the kidney. There was no evidence that the left adrenal gland was injured.

The injury to the pancreas must be attributed to indirect rather than direct action of the missile. The fact that the wall of the cavity is lined by fibrin, well advanced in organization, indicates that the injury to the tissues was produced at the time of the shooting. The absence of bacteria from the tissues indicates that the wound was not infected at the time of the shooting and that the closure of the posterior gastric wound was effectual. The necrosis of the pancreas seems to us of great importance. The fact that there was no fat necrosis in the neighborhood of this organ indicates that there was no leakage of pancreatic fluid into the surrounding tissues. It is possible that there was a leakage of pancreatic fluid into the cavity behind the stomach, as the contents of this cavity consisted of a thick, grayish fluid containing fragments of connective tissue. In this case the wall of fibrin would have been sufficient to prevent the pancreatic fluid from coming into contact with the adjacent fat. The extensive necrosis of the pancreas would seem to be an important factor in the cause of death, although it has never been definitely shown how much destruction of this organ is necessary to produce death. There are experiments upon animals upon record in which the animals seem to have died as a result of not very extensive lesions of this organ. One experiment of this nature, reported by Flexnor, Journal of Experimental Medicine, Volume II, is of interest. The fact that concussions and slight injuries of the pancreas may be a factor in the development of necrosis is indicated by the researches of Chiari, Zeitschrift fur Heilkunde, Volume XVII, 1896, and Prager medicinische Wochenschrift, 1900, No. 14, who has observed (although a comparatively rare condition) extensive areas of softening and necrosis of the pancreas, especially of the posterior central portion, which lies directly over the bodies of the vertebrae, where the organ is most exposed to pressure or the effects of concussion. The wound in the kidney is of slight importance except as indicating the direction taken by the missile. The changes in the heart, as shown by the macroscopic inspection and the microscopic examination, indicate that the condition of this organ was an important factor. The extensive brown atrophy and diffuse fatty degeneration of the muscle, but especially the extent to which the pericardial fat had invaded the atrophic muscle fibers of the right ventricular wall, sufficiently explain the rapid pulse and lack of response of this organ to stimulation during life.

The cause of death of the President has been made plain by the autopsy. It was due primarily to a gunshot wound by a .32-caliber bullet fired at close range, devitalizing the tissues immediately surrounding its tract, so that gangrene of those parts injured, involving the stomach, pancreas, kidney, and other tissues, followed. The toxic products from these devitalized tissues were absorbed, and with the degenerated condition of the muscular tissue of the heart caused death, the final symptoms being those of exhaustion.

Report of Death.

Name of deceased: McKinley, William.

Office: President of the United States.

Date of death: September 14, 1901.

Time of death: 2.15 a.m.

Place of death: 1168 Delaware avenue, Buffalo, N.Y.

Date of burial: September 19, 1901.

Place of burial: Canton, Ohio.

Cause of death: Gangrene of both walls of stomach and pancreas following gunshot wound.

I hereby certify that McKinley, William, President of the

United States, died while at Buffalo, N.Y., as set forth in the record of his case, as follows:

The President was holding a public reception at the Academy of Music, Pan-American Exposition, Buffalo, N.Y., on September 6, 1901, and whilst shaking hands with the people was shot at 4.07 p.m. through the stomach by Leon F. Czolgosz.

There is good evidence that the disease (or injury) causing death was in line of duty, the facts being as follows: The President was shot by an assassin whilst receiving the people.

P.M. RIXEY,
Medical Inspector, United States Navy.

I must mention here the giving up by Mr. John G. Milburn of his entire home in Buffalo and the devoting of his whole time and energy to the care of the President.

In concluding this report I must also refer to the untiring and devoted services of Mr. George B. Cortelyou, secretary to the President, who, with Mr. Nelson P. Webster, Mr. M.C. Latta, members of the Executive staff, and Mr. C.A. Conrad, of the Post-Office Department, were on duty night and day. Executive Mansion Steward William Sinclair and Messengers Charles Tharin, Thomas Lightfoot, and Harry Mickie were also on duty at the Milburn house during the President's illness.

In obedience to the Department's orders, I was with the President's party at Buffalo, N.Y., on September 6. Upon arrival at the railroad station on its return from Niagara Falls, about 3.30 p.m., the President directed me to escort Mrs. McKinley to the Milburn house.

As soon as I learned of the attempt on the President's life I hastened to his side at the emergency hospital on the Exposition grounds and was in the operating room with him at about 5.30 p.m. The President was under the influence of the anesthetic administered by Dr. Eugene Wasdin, of the United States Marine-Hospital Service. Dr. M.D. Mann, with a full corps of assistants, was ready to begin a laparotomy, which all deemed imperative.

Being satisfied with the completeness of the preparation and the ability of the operating surgeon, I made ready to assist and watched every step of the operation. The wounds having been closed, and the President's condition being good, I requested Dr. Roswell Park, the medical director of the Pan-American Exposition, to send nurses and a surgical bed to the Milburn house and to take personal charge of the removal of the President, as I had to inform Mrs. McKinley of her husband's condition and make ready a room for his reception.

On his arrival I assumed charge of the case, having as consultants Dr. M.D. Mann, of Buffalo, N.Y.; Dr. Roswell Park, of Buffalo, N.Y.; Dr. Herman Mynter, of Buffalo, N.Y.; Dr. Eugene Wasdin, of the United States Marine-Hospital Service. Dr. Charles McBurney, of New York, joined the consultations at 3 p.m. September 8, and left for home after the 9.30 a.m. bulletin of September 12. Dr. Charles G. Stockton, of Buffalo, N.Y., joined the consultations at 5 p.m. September 12. Dr. Edward G. Janeway, of New York, and Dr. W.W. Johnson, of Washington, D.C., arrived and Dr. McBurney returned after all hope had departed. All were present at the autopsy. Dr. H.G. Matzinger, of Buffalo, N.Y., made all the urinalyses and also had charge of the chemical and bacteriological work. The histological examination of the tissues was made by Dr. H.R. Gaylord who, with Dr. Matzinger, performed the autopsy.

In addition to the pay raise that became effective Jan. 1, new withholding rates that apply to taxable wages will also alter every Navyman's pay check.

It is recommended that Navy members review their tax situation and make necessary adjustments with a revised W-4 form in order to claim the new "Special Withholding Allowance" if he qualifies.

Personnel are encouraged to visit their military pay office for details.—NAVNEWS, Washington, D.C.

OMBUDSMEN

Dear Doctor:

A number of programs have been initiated during the past few years by the Bureau of Medicine and Surgery to open channels for two-way communication between the Bureau and members of the Medical Department. I feel there are still individuals among our medical officers who have not had the opportunity to understand the Bureau's organization and therefore are not informed as to the appropriate office in the Bureau to contact for assistance with regard to their own specific problems.

To provide you with the maximum opportunity of keeping me informed of your problems and needs, I am designating the following Medical Department officers as Bureau contact points. If you wish, you may consider these as your Ombudsmen. You will note that each officer is assigned a specific area of responsibility.

1. Personnel matters:
   CAPT NP Kitrinos, MC, USN
   Head, Medical Corps Branch (Code 317)
   Bureau of Medicine and Surgery
   Navy Department
   Washington, D.C. 20390
   Autovon 294-4288
   Area Code 202 254-4288
2. Special projects, alterations, and MilCon planning:
   CAPT DA Murray, MC, USN
   Director, Planning Division (Code 41)
   Bureau of Medicine and Surgery
   Navy Department
   Washington, D.C. 20390
   Autovon 294-4222
   Area Code 202 254-4222
3. Investment Medical Equipment:
   CDR JJ Dean, MSC, USN
   Assistant for Logistic Support
   To Assistant Chief for Planning and Logistics (Code 4A)
   Bureau of Medicine and Surgery
   Navy Department
   Washington, D.C. 20390
   Autovon 294-4192
   Area Code 202 254-4192

I trust you will feel free to communicate either by letter or telephone with the above-named individuals, as necessary. They will keep me personally advised of your problems, and my staff and I will make every effort to be helpful in our responses. We will also gain from you information which will greatly assist us in constructive planning for the improvement of our Medical Department.

I would like to express once again my appreciation to you for your support and assistance in providing medical care to the Navy and Marine Corps family.

With warmest regards.

Sincerely,

G. M. Davis

G. M. DAVIS
Vice admiral, MC, USN
Surgeon General

TO THE DENTAL TECHNICIANS

On the occasion of the Twenty-Fourth Anniversary of the Dental Technician Rating, I wish to extend my personal congratulations and express my appreciation

for the outstanding service you have rendered to the Naval Dental Corps.

The vital role you perform wherever you serve as members of the Navy's health-care team contributes greatly to the health and well-being of Navy and Marine Corps personnel throughout the world.

To you and your families I send my best wishes for continued success and an even brighter future.

E.C. RAFFETTO
Assistant Chief for Dentistry
and Chief, Dental Division

MEDIC PROFICIENCY EXAMS

The second set of Medical Proficiency Examinations for medical laboratory workers is slated for May 6, at test centers across the nation.

Nearly 2,000 laboratory workers sat for the first set of examinations last November 20 at 126 test centers in the U.S. and abroad, including 30 military bases and three prisons.

The tests are designed to evaluate the knowledge and skills of both the medical laboratory specialist trained by the military and the civilian laboratory worker who lacks professional certification.

The new examinations are administered by the Educational Testing Service for the National Committee for Careers in the Medical Laboratory under a contract from the Manpower Division of the U.S. Department of Labor.

The second Proficiency Examination Program offers four tests in the laboratory areas of Blood Banking, Clinical Chemistry, Hematology, and Microbiology. All are one-hour paper and pencil tests, and a candidate may take one or more. His scores are sent only to him or to those he designates.

Norming scores (results achieved by a representative group of laboratory workers) provide a scale against which candidates' individual scores may be measured.

Major organizations of laboratory employers which have cooperated in test development and are supporting the use of Proficiency Examinations are: American Society of Clinical Pathologists, College of American Pathologists, American Academy of Microbiology, American Association of Clinical Chemists and the American Association of Blood Banks.

Deadline for applications is April 8.

Application blanks and a bulletin of information describing the examinations, giving test questions, and listing 75-100 test centers is available from:

Proficiency Examination Project
National Committee for Careers in the
Medical Laboratory
9650 Rockville Pike
Bethesda, Maryland 20014
or
Medical Technology Proficiency Examinations
Educational Testing Service
Princeton, New Jersey 08540

Only applications made on the official form will be accepted by ETS.

If a test center is not readily accessible, a candidate may request a special center. The Department of Defense has offered its cooperation in administering the examinations at bases not near the designated test centers. Deadline for requests for special test centers is March 25. — Washington, D.C., AFPS.

CHAMPUS NOTES

Nonavailability Statements. Pending revision of SECNAV Instruction 6320.8D, the requirement placed upon dependents of active duty members for the submission of DD Form 1251, Nonavailability Statement, as a prerequisite to payment of CHAMPUS inpatient benefits is modified.

Nonavailability statements will no longer be required (1) of dependents living in Iowa, Minnesota, Oregon, Vermont, West Virginia and Wisconsin or (2) of dependents in other areas who reside more than 30 miles from a uniformed service facility with capability of providing inpatient care to dependents. With respect to the 30-mile provision, it is recognized that in some instances it would be a difficult and time-consuming process to determine from a mail address the precise distance between the facility and place of residence. In such cases, i.e., when it cannot be easily determined that the dependent resides less than 30 miles from a facility, a nonavailability statement will not be required.

Dental Care During Pregnancy. Due to numerous inquiries received regarding the scope of dental care authorized during pregnancy, the following guidelines are provided:

Dental care required to eliminate foci of infection which might prove detrimental to the health of the expectant mother or unborn child is authorized to include extraction of teeth, endodontics, periodontics, restoration of carious teeth, oral hygiene treatment and those diagnostic procedures necessary to provide the aforementioned care. Gold restorations are

authorized but only if the doctor is unable to adequately restore the tooth by means of amalgam or another accepted dental material other than gold. Replacement, by means of a prosthetic appliance, of a tooth or teeth extracted during pregnancy is authorized. However, the replacement of teeth that were missing prior to the pregnancy is not authorized unless the absence of said teeth will result in marked diminution of the masticatory process, thereby resulting in nutritional deficiencies which could seriously compromise the pregnancy. If a prosthetic appliance is provided to replace teeth not extracted during pregnancy, written justification for this care from the physician and dentist must be submitted with the claim. Replacement of teeth, when authorized, must, of course, be accomplished by the most economical means that will adequately restore the dentition.

Upon completion of treatment, statements of charges for authorized dental care must be submitted to OCHAMPUS on DA Form 1863-2 and must be accompanied by a statement from the patient's obstetrician verifying the pregnancy and giving the estimated or actual date of delivery. Preauthorization for dental care which may be provided during pregnancy is not required. Dental care authorized during pregnancy terminates with the termination of the pregnancy, with the exception that those teeth extracted during the later stages of pregnancy may be replaced within a reasonable time subsequent to the termination of the pregnancy.

Plastic and Cosmetic Surgery. Procedures that are generally accepted as being part of "good medical practice" are authorized under the CHAMPUS. Plastic and cosmetic surgery should be considered as encompassing two major categories of procedures:

a. Procedures that are intended to, or are incidental to other procedures that are intended to, improve abnormal bodily functions or relieve pain.

b. Procedures that are performed solely for the purpose of changing or improving the appearance or form of the individual.

The decision as to whether a particular procedure falls in category a or b depends upon the purpose for which the procedure is performed, not on the origin of the condition to be remedied.

All procedures included in category a are authorized under CHAMPUS when performed by a qualified practitioner. Procedures included in category b are not generally authorized under CHAMPUS. They will only be authorized when the Director of OCHAMPUS determines, on the advice of competent professional authority, that the accomplishment of the procedure in question is essential to the health of the patient. — USHBP — CHAMPUS OFFICE, CODE 39, BUMED.

TV USE IN SUICIDE THERAPY

The Psychiatry Department of the Naval Hospital, NNMC, Bethesda, Md., in collaboration with the Center for Studies of Suicide Prevention, National Institute of Mental Health, is conducting a study using television in treating patients admitted to the Naval Hospital following suicide attempts. This is the first study using television videotapes in this manner, and the American Psychiatric Association (APA) has asked the Psychology Department of the Naval Hospital to participate in a half-day presentation at the APA annual convention in Dallas in May.

According to LCDR Walter T. Davison, MC, USN, of the Psychiatry Department and Harvey L.P. Resnik, M.D., Chief of the Center for Studies of Suicide Prevention at NIMH, the use of videotape recall is particularly applicable in the management of suicidal patients. The research team uses the Self-Exposure Experience (SEE) because after a suicide attempt patients frequently deny that they had any suicidal intent. This denial makes psychotherapy difficult or impossible.

Dr. Davison and HN3 Peter Christopher are on call 24 hours a day in case a patient is brought to the Naval Hospital for emergency care following a suicide attempt. When they are notified that a patient is being brought in, they hurry to location (usually the emergency room) with a portable videotape unit. The use of stomach pumps, transfusion, and other life-saving techniques used on the patient, are recorded on videotape.

When the patient is admitted to the Psychiatry Department for treatment, his initial psychiatric interview is also recorded on videotape. After initial testing, patients begin inpatient therapy which has three facets: living in a therapeutic community with other psychiatric patients; group therapy; and individual therapy.

At an appropriate time in the patient's therapy, determined by Dr. Resnik and Dr. Davison, the patient is shown an edited, ten-minute portion of the videotape of his admission. During the showing of the tape, the patient's galvanic skin response is monitored. His response to seeing the tape is also videotaped, as is his family's response to seeing the tape.

Seeing the medical treatment necessary to sustain his life, according to the researchers, makes it almost impossible for the patient and his family to deny the seriousness of his actions, thus facilitating psychotherapy. Dr. Davison and Dr. Resnik have been working

on the study since July 1971. So far they have developed the methodology and applied it to about 15 patients.

Also involved in this project with Dr. Davison and Dr. Resnik are Dr. Dean Schuyler of the Center for Studies of Suicide Prevention, NIMH, and Lani Waiwaiole of the Naval Medical School Television Section at the Medical Center, who has made the technical arrangements for the project. CAPT Thomas H. Lewis, MC, USN, Chief of Psychiatry at the Naval Hospital, NNMC, heads the clinical team composed of Dr. Robert A. Glick, Dr. Stuart L. Kaplan, Dr. George F. Kolodner and Dr. Lawrence Y. Kline, who are directly responsible for the care of the study patients. Dr. Philip R. Severy, Chief of the Emergency Room and Dr. Jack E. Zimmerman, Director of the Intensive Care Unit at the Naval Hospital, have coordinated the project in their respective departments. – PAO, NNMC, Bethesda, Md.

AFIP COURSES

Anatomic Pathology.

The 12th Annual AFIP Lectures will be held 27-30 March. The lectures review and compile recent information in Anatomic Pathology involving all organs and body systems. The course provides the busy practicing pathologist with a combined period of instruction and review and with the latest concepts in pathologic anatomy. Applicants must be members of the Medical Corps of the Armed Forces or Federal Services who are board certified or board eligible in pathology. Qualified civilian personnel may also apply. A nominal fee is required for non-Federal civilians.

Pathology of the Aquatic Environment.

The first continuing course in Pathology of the Aquatic Environment will be held at the Armed Forces Institute of Pathology, Washington, D.C. from 19-21 April 1972. The course is designed to present a comprehensive review of the pathology of the aquatic environment, particularly as related to aquatic accidents and their contributory factors. Man's exploration of the seas, military and industrial interest in the development of underwater life support systems, increasing popularity of aquatic sports, and the use of hyperbaric chambers in medicine create the need for better understanding of the untoward and pathologic effects of the interaction between man and the aquatic environment.

The relationships of pre-existing disease and environmental hazards and traumatic factors will be discussed, as well as the role of the pathologist in the investigation of fatal accidents. The course will include reviews of underwater physiology, drowning, decompression sickness, air embolism, aseptic bone necrosis, and the effects of dangerous and venomous marine animals. Attention will also be given to SCUBA fatalities, hyperbaric chamber accidents, and saturation diving. In addition, the preventive aspects and procedures for the medical investigation of accidents in the aquatic and hyperbaric environments will be presented. Requests for applications to attend this or the above course should be forwarded to:

The Director
Armed Forces Institute of Pathology
ATTN: AFIP-EDZ
Washington, D.C. 20305

Forensic Science Master's Degree Program.

The Armed Forces Institute of Pathology, Washington, D.C., and The George Washington University, Washington, D.C., have entered into an agreement whereby the University offers a program leading to the degree of Master of Science in Forensic Science. The master's degree program is under the academic jurisdiction of the University's Graduate School of Arts and Sciences and the Department of Forensic Science. Under the agreement, officers enrolled in the U.S. Army Inservice Professional Training Program in Forensic Medicine, in the residency in Forensic Pathology, and other qualified personnel as determined by the University, will be eligible to pursue studies at the Armed Forces Institute of Pathology towards this degree.

Signing of the agreement took place at the Armed Forces Institute of Pathology on 19 Jan 1972, with Arthur E. Burns, Dean of the Graduate School of Arts and Sciences, representing The George Washington University and COL Robert W. Morrissey, Director, representing the AFIP.

Information may be obtained by writing either Professor Theodore P. Perros, Chairman, Department of Forensic Science, The George Washington University, Washington, D.C. 20006, or, the Chief, Legal Medicine Section, ATTN: AFIP-DPF-F, Armed Forces Institute of Pathology, Washington, D.C. 20305.

UPCOMING MEETINGS

American College of Physicians.

The Fifty-Third Annual Session will be held 17-21 April 1972 at Atlantic City, N.J. The scientific program will cover the latest advances in internal medicine,

Washington, D.C., 19 January 1972 — The agreement-signing ceremony between The George Washington University and the Armed Forces Institute of Pathology was held in the AFIP's historic 19th century conference room, which was reconstructed of materials taken from the old Medical Museum, formerly on the Mall. The new affiliation will result in a program leading to the degree of Master of Science in Forensic Science.

Pictured (left to right) are: Eugene R. Magruder, PhD, Dean, General Studies, GWU; CAPT O.C. Lilienstern, Special Assistant for Legal Affairs, AFIP; MAJ James G. Zimmerly, Chief, Legal Medicine Section, Forensic Pathology Branch, AFIP; COL R.W. Morrissey, MC, USAF, The Director, AFIP (seated); Arthur E. Burns, PhD, Dean, Graduate School of Arts and Sciences, GWU (also seated); COL James L. Hansen, MC, USA, AFIP Deputy Director; and CAPT William A. Schrader, MC, USN, AFIP Deputy Director. (AFIP Photo)

with emphasis on the rapidly evolving field of immunology. A new feature will be Hotel-a-Vision. Several State of the Art Lectures and Panels will be taped for special programming to most of the hotels in Atlantic City. The programs will be distributed for elective viewing on hotel room televisions on Monday, Tuesday, and Wednesday evenings. Attendees are urged to register in advance.

American Society of Internal Medicine.

The Sixteenth Annual Meeting of the American Society of Internal Medicine is scheduled for 14-16 April, 1972, in Atlantic City. For information write to Mr. W.R. Ramsey, Executive Director, 525 The Hearst Building, Third at Market, San Francisco, Calif. 94103.

US Air Force Society of Clinical Surgeons.

The Department of the Air Force Medical Service will conduct their annual Air Force Society of Clinical Surgeons' Symposium at the Sheraton Motor Inn in Biloxi, Miss., during the period of 17-19 April 1972.

COL Marion J. Williams, MC, USAF, the Chairman of the Department of Surgery, USAF Medical Center, Keesler Air Force Base, has been designated the program chairman and all communications regarding the symposium should be addressed to him.

Travel support may be obtained in accordance with SECNAVINST 4651.15 series of 3 Jul 1969, BUMEDINST 4651.1 of 15 Jul 1970 or BUMEDINST 1520.8 series of 7 Jan 1972, as appropriate. Applicants approved for attendance must provide the program chairman with the following information: Name, title, rank and address.

Environmental Health Workshop.

The Navy Industrial Environmental Health Center will conduct a Workshop in Environmental Health on 1-5 May 1972 at the New York Statler-Hilton Hotel, N.Y. For further information contact Dr. W.A. Redman, Jr., 3333 Vine Street, Cincinnati, Ohio 45220. (513) 684-3947.

The program is directed toward Federal Occupational Medicine and should be of interest to physicians, nurses, safety officers, industrial hygienists and managers. Attendance is open to all interested persons. Naval Reserve and AAFP accreditation have been requested.

Naval Hospital Boston Spring Symposium.

The Third Annual Spring Symposium will be held at Naval Hospital Boston on 18 and 19 May 1972. The program will have as its theme "A Forward Look In Medicine." Separate sections are planned for medicine, dentistry, nursing, and administration. Physicians, dentists, nurses, and paramedical personnel, both civilian and military, are invited to attend and participate.

In keeping with the theme of the Symposium, the program will include those subjects in clinical medicine, dentistry, nursing and administration which are coming into use at the present time and appear to have strong potential for the future.

Persons desiring to participate are invited to submit abstracts, in duplicate, of not more than fifty words not later than 15 March 1972 to:

CAPT J.M. Young, MC, USN
Program Chairman
Naval Hospital Boston
Chelsea, Massachusetts 02150

A social event is planned for the evening of 19 May. Please plan to attend.

The Department of Defense has announced that an expansion of the drug abuse screening program will be in full operation by 1 July.

Currently, the Navy is conducting random testing of personnel in the Sixth and Seventh Fleets. Results thus far have revealed less than .3% of Navy personnel to be drug abusers.

Testing will be done at random for detection of opiates, amphetamines and barbiturates.

Overall objective of the random testing program is to provide early identification of individuals who require treatment and rehabilitation.

The program is designed to help drug abusers recover from the drug abuse syndrome prior to serious physical or psychological deterioration, to provide data on prevalence rates of drug abuse by areas and to deter experimental and casual use.

A Department of Defense Instruction (1010.1) signed Jan. 11, by the Assistant Secretary of Defense (Health and Environment) provides policy guidance for a worldwide random testing program to be in full operation by 1 July.—NAVNEWS, Washington, D.C.

A recent FDA assay survey of nitroglycerin tablets suggests that improper packaging has a crucial bearing on the drug's stability and potency.

The assay involved nitroglycerin tablets stored in a pen-shaped plastic container provided by pharmacies as a convenient means of carrying several days' supply. Dispensers containing the drugs were left standing at room temperature for 1-, 2-, and 3-day periods.

The nitroglycerin was found to have decreased to about 50%, 30% and 20% of initial potency after being left in the dispensers for these periods. FDA has requested recall of the dispensers.

The assay led FDA to conclude that unexplained patterns of therapeutic response by patients to nitroglycerin therapy may be caused by the manner in which the drug is packaged. Physicians should consider this possibility when evaluating patient response to the drug.

To avoid rapid loss of potency, nitroglycerin should be kept at all times in tightly-sealed glass vials. Physicians and pharmacists may wish to tell patients this when prescribing and dispensing the drug.—FDA Drug Bulletin, Rockville, Md.

OFFICIAL INSTRUCTIONS AND DIRECTIVES

BUMEDINST 6470.11 OF 14 OCT 71

Subj: Biological Effects of Electromagnetic Radiation Project Office; designation of

This instruction designates a BUMED Project Office entitled Biological Effects of Electromagnetic Radiation (EMR) and promulgates a Charter which: specifies the scope, operating relationships, organization; and delineates the authority and responsibilities of the Project Office within BUMED. The Head of the Project Office (CDR Paul E. Tyler, MC, USN) shall report directly to the Director, Research Division, BUMED (CAPT L.F. Miller, MC, USN), and shall establish direct contact with responsible persons within other navy offices.

BUMEDINST 6470.12 OF 26 JAN 72

Subj: BUMED Radiation Effects Advisory Board; appointment, functions, and responsibilities of

The purpose of the Radiation Effects Advisory Board is to provide assistance to the medical departments of field activities in evaluating relationships of alleged or true radiation exposure to personnel injury in cases involving the Bureau of Employee Compensation or Veteran's claims. The Board shall be composed of: Director, Submarine, Diving, and Radiation Medicine Div., (BUMED Code 74), Chairman; Director, Armed Forces Radiobiology Research Institute, NNMC, Bethesda; Head, Radiation Safety Branch (BUMED Code 742); Chief, Radiology, Nav Hosp Bethesda; Chairman of Radiation Biology Dept., Armed Forces Radiobiology Research Institute, Bethesda; and Photodosimetry Technical Consultant to BUMED, NNMC, Bethesda, Secretary. The Board will have as ex officio members outstanding clinical specialists, i.e., Chiefs of Ophthalmology, Medicine, Hematology, etc. at our naval hospitals. In addition, civilian specialty consultants may be used.

The Advisory Board will assist in evaluating the relationship of radiation exposure to personnel injury or illness. Upon return of a case evaluation, Medical Dept. personnel shall record the information in appropriate medical records, forms or reports and shall so inform the facility commander of such action in order that he may fulfill his responsibilities in accordance with the Federal Personnel Manual, Chapter 810.

BUMEDINST 6700.26B OF 15 OCT 71

Subj: Basic equipping of Navy ambulances and training of personnel

Promulgates a basic list of material to be carried in ambulances at all times and assigns responsibility for the training of personnel for ambulance duties. Directs that a routine inspection be conducted daily to test and check equipment in each ambulance.

✝ In Memoriam ✝

CAPT William C. Cantrell, MC, USN (Ret.) died 10 Jan 1972. He was born in Hamilton, Ala., on 2 Dec 1917. Dr. Cantrell received a B.S. degree in 1934 from the University of Alabama, and his M.D. degree from George Washington University in 1942. He entered the naval service in 1942 and was serving aboard the USS RENO when it was hit by a Japanese plane and later torpedoed. Dr. Cantrell was awarded a personal commendation with "V" for his actions in the RENO. Later he was assigned on TAD orders to the USS BIRMINGHAM to assist in caring for casualties resulting from an explosion in the USS PRINCETON. For his service there he was awarded the Bronze Star with "V" and also received a Navy Unit Commendation. After WW II, CAPT Cantrell specialized in orthopedic surgery and served as chief of orthopedics in several naval hospitals in the U.S. CAPT Cantrell's name was placed on the Retired List in June 1961.

CAPT George M. Frazier, DC, USN (Ret.) died 13 Jan at the Norfolk Marine Hospital after a long illness. He was born in the District of Columbia on 23 Sep 1887. After receiving a degree in dental surgery in 1913 from George Washington University, he was commissioned LT(jg), DC, USN, and entered naval service in Mar 1917. CAPT Frazier served aboard several battleships and also served in Santa Domingo and Haiti. In 1943, he was appointed Chief of the Dental Corps and served in that capacity until his retirement in 1945. After naval retirement he estab-

lished a private practice in Norfolk, Va., where he retired from practice in 1962. CAPT Frazier is survived by his wife, Evelyn, and two stepsons.

CAPT Fay O. Huntsinger, MSC, USN (Ret.) died of myocardial infarction with acute pneumonia on 8 Jan at the Naval Hospital San Diego, Calif. He was born in Freeport, Ind., on 10 Jul 1898. Upon graduation from high school in 1916, he enlisted in the Navy. CAPT Huntsinger held all enlisted ratings and was promoted to Warrant Officer in 1923. He served in the various Hospital Corps Schools on both the east and west coasts and was the Executive Officer of the Hospital Corps School in San Diego from Aug 1950 to Apr 1953. CAPT Huntsinger progressed through the officer ranks and was the second Medical Service Corps officer to reach the rank of CAPT, which he attained in 1955. He retired in 1956 after 40 years of service. CAPT Huntsinger is survived by his wife, Ann, and a daughter.

LCDR John E. Pavlick, MSC, USN, died after a prolonged illness on 11 Jan at the Naval Hospital, NNMC, Bethesda, Md. He was born 12 Apr 1928 in Barnesboro, Pa. After graduation from Barnesboro High School in 1946, he enlisted in the Navy and upon completion of recruit training began his naval career as a ward corpsman at the Naval Hospital Portsmouth, Va. During the Korean conflict he served with the First Marine Division which was awarded the Navy Unit Commendation. Mr. Pavlick later served at Camp David, the Presidential retreat, from 1954 to 1957 and for which service he received the White House Service Certificate. In Sep 1959, he was commissioned an ensign in the Medical Service Corps. He was a 1964 graduate of the Naval School of Hospital Administration and in 1968 received a bachelor's degree from George Washington University. At the time of his death, he was the administrative officer for the Physical Qualifications and Medical Records Division, BUMED. LCDR Pavlick is survived by his wife, Jane; two daughters, Jeaneen and Joni; his mother; two sisters and two brothers.

CAPT Fay O. Huntsinger, MSC, USN (Ret.)

CAPT Hillard L. Weer, MC, USN (Ret.) died 14 Jan. Born on 5 Sep 1888 in Bluffton, Ind., he was a graduate of the Indiana University Medical School class of 1913. Dr. Weer was commissioned LT(jg), MC, USN, on 10 Dec 1918. After serving in BUMED from 1927-1930, CAPT Weer was assigned to duty with the First Brigade, USMC, in Haiti where he remained for almost four years. He later assumed medical duties at the Navy Yard, Philadelphia. CAPT Weer's name was placed on the Retired List in Jul 1940. He is survived by his wife, Gladys.

Unfortunately, the supply of U.S. NAVY MEDICINE publications is limited. No Hospital Corpsmen, and only a limited number of Nurse Corps officers normally receive individual copies. Please don't throw away your copy — pass it along to other members of the Navy Medical Department family who fail to receive it. Be sure your nurses and corpsmen get to see this periodical which often contains information of interest to them.

United States Navy Medicine

CORRESPONDENCE AND CONTRIBUTIONS from the field are welcomed and will be published as space permits, subject to editing and possible abridgment. All material should be submitted to the Editor, U.S. Navy Medicine, Code 18, Bureau of Medicine and Surgery, Washington, D.C. 20390

NOTICES should be received not later than the third day of the month preceding the month of publication.

PROFESSIONAL PAPERS AND ARTICLES should be typewritten on one side of the paper, double spaced, with liberal margins. Original and one carbon copy are required. Generic names of drugs are preferred. If the author's present affiliation differs from that under which the reported work was done, both should be given. Unless otherwise indicated, it will be assumed that the article presented has not been previously printed or delivered elsewhere. Papers which have been delivered or printed elsewhere, covered by copyright, cannot be reprinted in Navy Medicine without the written permission of the author(s) and copyright holder. It is the responsibility of the author(s) to inform U.S. Navy Medicine when the material submitted has been previously used or copyrighted. Navy Medicine will be happy to request permission to reprint from the copyright holder when this is necessary.

ILLUSTRATIONS are acceptable when they substantially contribute to the understanding of the basic material. Only distinct, glossy, black and white PHOTOGRAPHS which are functional can be printed. Prints should not be mounted, stapled, clipped or otherwise deformed and can be marked lightly on the back with the figure number. Legends should be typed consecutively on a separate paper with the indicated figures; credits for the photography may also be included. Identities of patients should be masked. DRAWINGS, TABLES AND GRAPHS should be minimal in number and properly labeled. They should be neatly done in heavy black ink on white paper, one to a page.

SUGGESTIONS are invited concerning U.S. Navy Medicine, its content and form.

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POSTAGE AND FEES PAID
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"By your leave SIR." The customary salute is rendered to just promoted and now senior husband LTJG Jeffrey C. Miller, USNR by his wife ENS June E. Miller, NC, USNR. The promotion ceremony took place at Naval Beach Group ONE, Naval Amphibious Base Coronado, Calif., where he is stationed. ENS Miller is a navy nurse at Naval Hospital, San Diego, Calif. The Millers reside in Coronado.—PAO, U.S. Naval Amphibious Base, San Diego.

U.S. NAVY MEDICINE

*U.S. Government Printing Office: 1972—483-832/8